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Iosif G. Dyadkin

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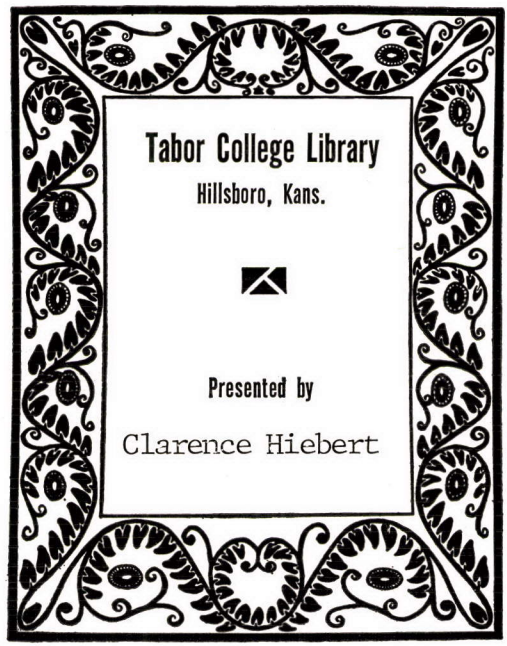

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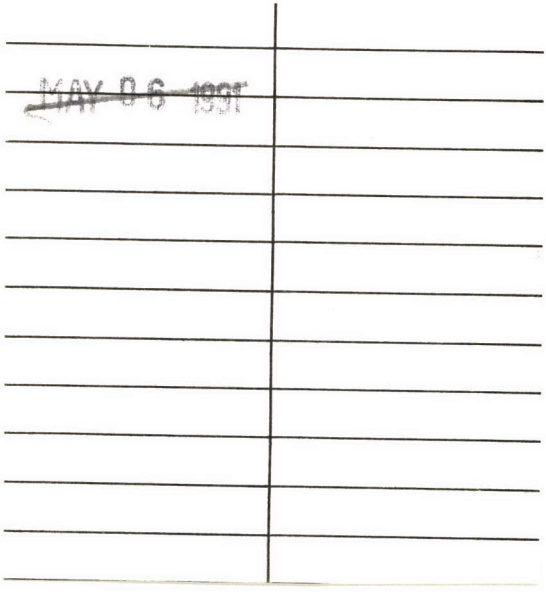
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Unnatural Deaths in the USSR, 1928–1954

IOSIF G. DYADKIN

Introduction by Nick Eberstadt

Translated by Tania Deruguine

Transaction Books
New Brunswick (U.S.A.) and London (U.K.)

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Director
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Freedom House, New York

Introduction

Demographic catastrophe is not new to man. Abrupt and brutal reductions in human numbers have occurred throughout recorded history with such regularity as to suggest that they are the rule rather than the exception. Archaeologists and anthropologists believe they have identified evidence of mass loss of human life as far back as the neolithic era.[1] It is safe to assume that this phenomenon shaped the human condition even earlier, when the continued survival of the species was still an open question.

Demographic catastrophes are a continuum in the human experience: they have visited man, through diverse agencies, in a tremendously varied array of cultural, social, and economic settings. Nomads of the North American plains and civilization builders of the Mayan uplands, animist tribesmen settled along West Africa's Bight of Benin and Christian serfs of medieval Europe, Chinese peasants toiling under hydraulic tyrannies and the Mongol army people who were to conquer them—all came to know the horror of sudden and uncontrollable epidemics of death. Yet while the specter of demographic catastrophe has almost always hung over human societies, it would be wrong to conclude that there is something "characteristically human" about spasms in the mortality rate or the tragedies they bring about. Quite the contrary: inexorable cycles of mass death are the ecological characteristic which typifies all *lower* orders of social creatures. For man, demographic catastrophe comes as a denial of his uniqueness, for it demonstrates in the grimmest ways his animal helplessness, his inability to escape the rules of social biology that govern colonies of ants or schools of fish. One of the things which distinguishes man from all other species is his ability to harness creative intelligence to the task of protecting and preserving life. Thus for the statistician, the spark of humanity is lit up on charts not by episodes of demographic catastrophe, but rather by the results of far-reaching efforts to avoid them.

The nineteenth century marked a decisive break in man's population history: from a technological and administrative standpoint, demographic catastrophe ceased to loom as an unavoidable threat. Revolutions in agricultural technique, medicine, sanitation, public hygiene, transportation, communication, and education all played their part in helping societies not only beat down the death rate, but stabilize it. Ironically, Malthus's influential *Treatise on Population,* which warned of the likely recurrence of immutable cycles of ecologically generated demographic catastrophes, appeared precisely (1798) as that era was ending. Europe's last environmentally induced mass disaster was the Irish Potato Famine of 1846–49. Today only that tiny fraction of the world population beyond the workings of the world economy (and international relief) must worry about sudden death through the fickleness of nature: wanderers at the edge of the Saharan desert, mountain people of the Himalayas, and other preliterate groups relegated to remote and fragile terrain.[2]

In the wake of systematic breakthroughs in knowledge, there has been an explosion of health on this planet: the average human lifespan has risen from something like 30 in 1900 to over 60 today,[3] and the global population is approaching its second doubling in less than a century. The twentieth century marks a second break in man's demographic history, and a less happy one. Despite the existence of know-how which would permit them to be abolished, demographic catastrophes have not become a thing of the past. Instead they have struck repeatedly, and with a fury which perhaps only the twentieth-century mind could conceive. Since demographic catastrophes are now almost always avoidable, or at least containable, the continuation of such disasters seems particularly cruel. Powerful forces must be at work to keep this terrible anachronism current. And indeed they are: for just as the nineteenth century saw the beginnings of a revolution in the forces which might augment life, the twentieth century has witnessed a transformation of the forces promoting death.

Death has become a ward of the state. As a result of technical innovations and the rise of the modern state apparatus, the lifespan of every nation has become increasingly dependent on government actions. The vast majority of states have used the new power at their disposal to extend the lives and improve the material security of their citizens. (Partly as a result of these efforts, there are now nations on Earth where the life expectancy of entire populations is approaching the limits of

medical abilities—Japan, Sweden, Iceland, and the Netherlands are among them.) But under a certain set of regimes, mass death has been courted, and finally embraced, as an instrument for enacting social policy. With increasing regularity, demographic catastrophe is the result of a leader's decision to wage war on his own people.

Not all state-administered demographic catastrophes of our century share a common pedigree. One need only consider the fate of postwar Africa to appreciate this. In the 1970s, Burundi's exercise in mass liquidation was inspired principally by ethnic hatred; in the Central African Empire, the inveterate Francophile Bokassa I seemed at times to be attempting an indigenous interpretation of the Jacobin reign of terror (miscasting himself as both Robespierre and Napoleon); in Equatorial Guinea and Uganda, the motives and purposes of Macías Nguema and Idi Amin, both now deposed, remain obscure—it is often said they were mad, but it seems cavalier to dismiss men of such proven cunning and calculation so easily. If there is a common theme to these sad stories, it is that mass terror and death are no longer the exclusive preserve of fully developed state systems under leaders with grand visions and guiding rationales.

But in sheer orders of magnitude, ad hoc efforts at demographic catastrophe have left a much smaller mark on humanity than the attempts which were studied, "scientific," directed by some ambitious and internally coherent strategy and legitimized by ideology. Those terrible "experiments" all emanated from the family of totalitarian states. In the name of building an earthly paradise, the great totalitarian powers reduced flesh and blood to construction material. But unlike construction material, many of the subjects under these regimes were assigned a negative worth; for reasons of strategy or ideology, it was important to their leaders that they perish. With the power of the modern economy and the precision of managerial sciences against them, the odds of survival for the disfavored were low. In the areas of Nazi occupation under Hitler, in Mao's China, and in Khmer Rouge Cambodia, deliberately contrived demographic catastrophes severed the connection of entire societies with the rest of the twentieth century, and pushed them into something eerily new, a Dark Age powered by electricity.

The Soviet Union occupies a unique position in the constellation of killer states. It was the first government of the century to make the decision to annihilate large numbers of its citizens to secure domestic political objectives. It was also the first innovator and experimenter in

this field: the Nazi concentration camps were modified versions of Soviet originals, whose evolution the German leadership had followed with some care. Unlike Nazi Germany, however, there were no pockets of population in the USSR under Stalin which could expect to be spared by dint of "racial" background or enduring political loyalty. Unlike Mao's China, the great bulk of unnatural mortality in the Soviet Union cannot be ascribed to the tactical miscalculation of the leadership.[4] Rather, it was an integral element of Stalinist rule, arguably a sine qua non. And in distinct contrast to the Khmer Rouge, the Communist Party of the Soviet Union (CPSU) under Stalin did not undermine itself by the artificially created famines, the mass deportations of guiltless citizens, the forced-labor death camps, and the cycles of political terror which it elevated to statecraft. Instead, it not only succeeded in increasing the power of the central government through all this, but actually managed to turn the USSR into a global superpower. The Soviet Union is not only the original killer state, but the model one.

Robert Conquest has written that the modern world cannot be understood if we do not understand the Soviet Union, and that the Soviet Union cannot be understood without understanding how it came into being.[5] Taking this line of reasoning one step further, it may be argued that we cannot understand the ways the Soviet Union came into being without some sense of the human cost exacted in the process. The task of estimating the numbers of people lost in the demographic catastrophes harnessed to the formation of the modern Soviet state is of great interest to students of population, but not to them alone.

That it has been exceedingly difficult to estimate the human losses wrought by state-created demographic catastrophes is hardly surprising. In part, the reason is historical. Many societies struck by demographic catastrophe were still very poor, and since lack of information is a hallmark of poverty, scholars are often left with little to go on as they attempt a quantitative reconstruction of the past. In Cambodia, for example, the only reasonably complete census dates from 1962, and even that was fraught with errors.[6] It seems unlikely that the toll in Cambodia, Uganda, and other statistics-starved societies will ever be totaled with much accuracy.

Another difficulty concerns politics. Killer regimes have no interest in advertising their carnage: however necessary mass killing may be to the modus operandi, underscoring the fact almost never serves purposes of state. The Nazi's systematic destruction of the Jews, for exam-

ple, was carefully misrepresented even in the Reich's internal documents. The official effort to disguise mass murder went so far as to have false death certificates manufactured in a regular manner. Our knowledge of the demographic dimensions of the Holocaust comes largely from the fact that the Nazis were unable to destroy the records of their concentration camps and the reports from their *Einsatzgruppen* before these fell into Allied hands. Yet despite the availability of these data, the existence of independent and accurate information on the size of prewar Europe's Jewry (collected and assembled mainly by the Jewish Agency), widespread interest among the survivors not only in commemorating but also in individually identifying victims, and the great, ongoing deployment of scholarly talent to the examination of the Holocaust, a margin of error in excess of 5% seems likely to remain.[7] In human terms, this "margin of error" amounts to perhaps 300,000 people or more.

For both political and historical reasons, it would be unreasonable to expect the count of victims in the USSR to achieve that level of accuracy. The relevant Soviet archives have never been opened to Westerners; indeed, there are indications that access to the information they contain is strictly limited even high within the CPSU. Such records, in any event, would only tell part of the story, for only a fraction of the victims of the Stalinist state died in the Gulag or in front of the firing squad. Census information, through which unnatural demographic losses might ideally be traced—though with a margin of error—is highly problematic for the USSR. Population data from the Czarist era leaves much to be desired: only one full census was attempted, and that in 1897. The Soviets inherited a statistical system with limited capacities; their development of it was shaped by two contradictory influences. On the one hand, since the CPSU aspired in principle to direct all aspects of life in the society under its command, there was a need for comprehensive, detailed, and reliable information. On the other, there was an inexorable politicization of data, for honest information allows independent thought, and thereby provides a base for critical judgement of a regime and its administrators. The result has been an urge for falsification which can be partially controlled but never fully suppressed.

Even though demographic numbers would seem less susceptible to falsification than other data—it is comparatively easy to tell if someone is dead or alive—the history of Soviet census taking is illustrated with

irregularities. The 1937 census, for example, has never been released. Kraval, the director of TsUNChU (the Statistical Central Office) and the other top administrators responsible for the project were charged with treason. In the words of *Pravda,* they had been caught plotting "to diminish the population of the USSR."[8] They were shot. Their successors apparently did not make the same mistake, for the 1939 census was judged fit for partial release. Its population total may have exceeded the earlier total by 20 million or more.[9] The correspondence between the 1939 numbers and contemporary Soviet demographic reality is conjectural. Yet the methods and lessons of that census were specifically cited by Soviet authorities as the basis for the 1959 census, the next count for which detailed data was released.[10] Since the Central Statistical Administration (TsSU) has not been overhauled since then, it appears that the 1970 and 1979 censuses also rely on an ambiguous legacy. The serious inconsistencies between the 1959 and 1970 numbers—which include apparently negative death rates for many cohorts born between 1910 and 1930—and the delay in releasing the figures for 1979 demonstrate the continuing nature of this political problem.[11] The methods by which mortality rates might ordinarily be reconstructed—reverse survival techniques and the like—are largely ineffective on Soviet data because the errors in them are neither randomly generated nor entirely inadvertent. Barring unforeseeable changes, it does not seem likely that the toll from the USSR's demographic catastrophes will ever be known to even the nearest million.

Iosif Dyadkin's book is a heroic venture into these uncertain statistical grounds. Dr. Dyadkin, a scientist from Kalinin, wrote it in 1976, when he was with the Kalinin Branch of the All-Union Institute of Geophysical Research. To ponder, on paper, the human costs incurred in the construction of the Soviet state was of course an act of physical courage, for official protestations of "de-Stalinization" notwithstanding, open discussion of Stalin's crimes is once again taboo, and those who dare bring these up risk both harrassment and arrest. But Dyadkin's efforts to chart out the course of unnatural population losses from 1928 to 1954 involves intellectual bravery as well. In his calculations, Dr. Dyadkin relies exclusively on the contradictory data which may be gleaned by any ordinary Soviet citizen from the variety of official Soviet sources touching on the nation's demographic history. The careful and illuminating work of Frank Lorimer, Warren Eason,

and Murray Feshbach, Westerners who have done so much to clarify the outlines and answer questions about the USSR's population movements, appear to have been totally unavailable to him. And as Dyadkin himself emphasizes, he is a geophysicist, not a demographer. This is a formidable set of restrictions. But in the face of them, Dyadkin has handled himself respectably.

Dyadkin's approach to the problem of unnatural mortality is not, one must emphasize, that of the demographer. The size and age-sex structure of a population is determined by a complex and changing schedule of fertility and mortality rates, or to put it another way, population change is a matter of dynamic adjustment rather than comparative statics. Given the few data points available to him, Dr. Dyadkin's manipulation of data affords the reader a reasonable, and probably conservative, first approximation of the magnitude of unnatural mortality under Stalin. It is worth mentioning that Dyadkin's own estimates for fertility and mortality in the 1930s correspond closely with those reconstructed by a leading Soviet demographer, the late Boris Urlanis, several years after *Unnatural Deaths* was completed.[12] It is also noteworthy that Dyadkin places the margin of error on his own calculations of excess mortality in the vicinity of 10 million. A small nation—a Cuba or a Sweden—could entirely disappear in the uncertainty surrounding the edges of the Stalinist demographic catastrophe.

Dr. Dyadkin's compelling figures highlight aspects of Soviet history which are not always understood or appreciated in the West. Perhaps the most important of these involves the USSR's losses in World War II and the years immediately thereafter. Dyadkin's figures are considerably higher than what is claimed in the East or generally believed in the West. Not that the estimate in conventional circulation fails to shock: 20 million deaths on and off the battlefield would represent devastation of almost unimaginable proportions. But Dyadkin's numbers suggest that even this staggering number of fatalities was underreported by many millions. It appears that the USSR fought a two-front campaign in World War II. The first front was against the invaders; the second against its own citizenry. Terrible losses against the Nazis were perhaps inevitable; as Alan Milward has pointed out, the Soviet Union was the only major combattant which had to finance rapidly rising defense needs on a rapidly diminishing economic base.[13] But by its treatment of its own people—by deporting entire nationalities (women,

children, the elderly) on charges of race treason, by maintaining and possibly even increasing the forced labor workforce as the population shrank, by treating not only captured Soviet soldiers but also the victorious Red armies which swept through to the Elbe to punishments reserved elsewhere for spies, the losses inflicted by the Soviet state upon its own people rivaled any the Germans could inflict on the battlefields. Warlike levels of mortality continued well into the late 1940s, as the Gulag digested a huge new serving of prisoners and the tactics of Soviet control were asserted in both reclaimed territories and new acquisitions. By any demographic measure, the peoples of the USSR were not to enjoy "cold war" until the 1950s.

Another aspect of Dyadkin's work which will be of interest to many is its estimation of the size of the Gulag in the years around Stalin's death. Many authors in the West have argued that the Gulag contained 10 million people or more in the late 1940s and early 1950s. Another group had much lower estimates.[14] Dyadkin's figures of 3–6 million, derived from both calculations and assumptions, coincides with the latter. The casualties Dyadkin associates with these camps, moreover, appear to be substantially lower than many Western estimates. A death rate of 15–30 per thousand, as Dyadkin notes, would be five to ten times higher than what one would normally expect for healthy adult males; yet it would also be much lower than the 100 per annum commonly ascribed to the labor camps and political colonies, much less the 250 which has been proposed for the arctic death camps in Kolyma.[15] Dyadkin's document should prompt scholars who can read freely and write without fear into a closer examination of the Gulag losses. One would hope that it will encourage Western scholars to undertake a thorough review of the mortality record of the Soviet state since its inception.

The present Soviet statistical system's ambiguous relationship with its own past is a metaphor for the Soviet body politic as a whole: while the worst excesses in earlier years have been covered up or corrected, the system has historical roots which remain unaltered and still proscribe its actions.[16] Neither the numbers nor the system that generates them can withstand independent scrutiny, least of all from within. Dyadkin's numerical exercise was bound to trigger state reprisal. In March 1980 Dr. Dyadkin, who had discussed and circulated his manuscript within the Soviet human rights movement, was stopped by au-

thorities during a trip in Crimea. They "found" a knife in his car which they immediately identified as having been used to rob a woman the previous night. In the course of the ensuing interrogation and search, police agents discovered several of Dyadkin's notebooks and some photocopies from an article by the émigré historian Mikhail Bernshtam. On April 25 Dr. Dyadkin was taken from work and arrested. He was charged with violations of article 190-1 of the Russian Soviet Federation of Socialist Republics (RSFSR) criminal code: defaming the Soviet state. On June 1, he underwent psychiatric examination. Instead of being shunted off to a "mental hospital," it was decided that he was "responsible": fit to be tried. Dyadkin's trial lasted three days, and centered on the book you are about to read.

The prosecution brought in experts to review *Unnatural Deaths*. According to *The Chronicle of Current Events*,[17] the Soviet human rights journal, "Kalinin University professor . . . V. V. Petrov . . . stated that although Dyadkin's original data did not raise any doubts, his method was scientifically unsound. The fact that for three or four periods Dyadkin had obtained figures approximating those published in the Soviet press . . . was dismissed by Petrov as pure coincidence." Toward the end of the trial the prosecutor intimated to Dyadkin that "people of his sort"—presumably meaning Jews and dissidents—do not feel "quite themselves in our country." Dyadkin replied that he felt "quite himself everywhere in his homeland, including prison." On September 18, Dyadkin was sentenced to three years in a labor camp. His appeal was routinely rejected, and on January 17, 1981, he arrived in the Tyumen region of Western Siberia to begin his sentence.

Dr. Dyadkin is incarcerated with common prisoners, and is engaged in cutting timber, although he is no longer a young man. Like other prisoners in Soviet labor camps, his diet is mainly watery gruels. The World Health Organization and the Food and Agricultural Organization of the United Nations currently place the caloric needs of their "reference man" (65 kilograms; temperate climate; moderate physical activity) at 3,000 calories per day if he is expected to maintain his weight. By regulation, Soviet penal colonies and labor camps are not supposed to feed their prisoners more than 2,400 calories a day. If a prisoner is being punished, rations are even less. Hunger and cold are regularly used in Soviet camps and prisons as "educational measures" intended to break a man's health and thereby perhaps his spirit. Iosif

Dyadkin has become a victim of the terror apparatus whose results he attempted to quantify. Let us hope he does not become an additional cipher among what he has referred to as the "silent players" in the ongoing Soviet Revolution.

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Notes

1. Stig Welinder, "Prehistoric Demography," *Acta Archaeologica Lundensia* 8 (1979):39-48, 104-7; and James W. Lallo and Jerome C. Rose, "Patterns of Stress, Disease, and Mortality in Two Prehistoric Populations from North America," *Journal of Evolutionary Studies* 8 (1979):323-35, are but two examples of studies in this genre. As might be expected, it is extraordinarily difficult to map out mortality patterns for small, seminomadic groupings of men and women who traveled light and passed through life thousands of years ago. For this reason, archaeologists and anthropologists often resort to the expedience of long-term population growth rates as a proxy for mortality fluctuation. The method is not without its problems. See Mark Nathan Cohen, *The Food Crisis in Prehistory* (New Haven: Yale University Press, 1977), pp. 60-70.
2. Charles D. Laughlin and Ivan A. Brady (eds.), *Extinction and Survival in Human Populations* (New York: Columbia University Press, 1978) is one of the few recent compilations of psychological and anthropological studies on this diverse array of threatened peoples. Almost inevitably the study of "dying races" is tinged with romanticism; what is seldom emphasized in such works is the remarkable extent to which preliterate peoples manage to protect themselves from demographic catastrophe in times of ecological crisis. The point is worth making. In the western Sahel, for example, several years of continuous drought in the early 1970s decimated livestock herds, but the effect on human death rates is believed to have been limited. See John C. Caldwell, *The Sahelian Drought and its Demographic Implications* (Washington, D.C.: Overseas Liason Council, 1975).
3. Nick Eberstadt, "The Health Crisis in the Soviet Union," *New York Review* (February 19, 1981):23.
4. There are no certain figures for the human toll exacted by successive political campaigns in the Maoist era. Many people were killed during land reform, for example, but whereas internal PRC documents from early 1950 anticipated that 10 million "landlord elements" would have

to be "eliminated," Mao himself put the number of landlord "liquidations" at 800,000. Franz Schurmann, *Ideology and Organization in Communist China* (Berkeley: University of California Press, 1973), p. 437. Figures for the death toll from the Cultural Revolution also span an order of magnitude. At their trial, Chiang Ch'ing and the other members of the Gang of Four were accused of responsibility for just over 34,000 deaths attendant to the turmoil of 1966–76. This charge explicitly excluded governmental "mistakes," which seem to have been both numerous and costly. In a single four-month period in 1968, the cities of Suchou and Liuchou are said to have experienced more than 50,000 battle deaths in military-style campaigns pitting the Red Guards against the People's Liberation Army. Jürgen Domes, *Die Ära Mao Tse-tung* (Stuttgart: W. Kohlhammer, 1971), p. 179. In 1979 a "reliable Chinese source" told a reporter for Agence-France Presse that over 400,000 people had perished in the Cultural Revolution's bloodshed. Fox Butterfield, *China: Alive in the Bitter Sea* (New York: New York Times Books, 1982), p. 348. Yet in 1980, the Governor of Kwangtung, on a trip to Macau, remarked that over 40,000 people had been killed during the Cultural Revolution in his province alone. Reuters wire, June 9, 1980. If proportionality held over the whole of China, this would have meant more like a million deaths. Even higher figures would not be beyond the realm of possibility. Several million Chinese may have died directly and necessarily as a result of strategic decisions made by their leaders after the Liberation. Such deaths may be ascribed to calculated cruelty. Yet the toll from these campaigns would appear to pale next to the losses from hunger and disease in the wake of the Great Leap Forward. Again, there is no final, reliable figure for the casualties from that calamity. A U.S. Bureau of the Census study, yet to be released, has worked over Chinese data from the 1953 and 1964 censuses and come to the conclusion that "excess mortality" during the Three Lean Years could have been as great as 40 million or as low as 16. Officially, Chinese leaders now talk of over 10 million "deaths from hunger" during those years. *International Herald Tribune* (April 20, 1981). While it would be disingenuous to claim that the leadership of the Chinese Communist Party was not responsible for the total failure of the agricultural system which brought these deaths on, it would also be unfair to blame them with deliberately planning to starve off the peasantry. This was no antikulak program; to the contrary, these awful results were largely inadvertent. The program which led to this disaster appears to have had less to do with domestic strategy than tactical miscalculation geared toward the international arena. The Chinese Communist Party leadership, and especially the circle surrounding Mao, appears to have been frightened by China's deteriorating relationship with the USSR in the late 1950s. The decision to embark upon a program of crash industrialization so that a modern, technological-nuclear economy might be established overnight has more of the touch of the dreamer than the cold-blooded liquidator. For more information on the interna-

tional factors affecting the Great Leap Forward, see Adam B. Ulam, *Expansion and Coexistence: Soviet Foreign Policy, 1917-73* (New York: Praeger, 1974), pp. 613-28.

5. Robert Conquest, *The Great Terror* (London: Macmillan, 1973), p. 7.
6. Jacques Migozzi, *Cambodge: faits et problèmes de population* (Paris: Centre National de la Recherche Scientifique, 1973), pp. 118-21.
7. At the Nuremberg tribunal in 1945, the number of Jews murdered or forced to perish under the Nazis was put at exactly 5,721,800. Such precision may be needed in legal briefs, and may have been thought useful to impress into the popular consciousness not only the immensity but also the specificity of the Nazi atrocities, but it was not warranted by the demographic evidence available, then or now. Several years after Nuremberg, Gerald Reitlinger published a study of the Holocaust in which he carefully examined the records available in the West, and came to the conclusion that the total for unnatural loss of Jewish life was about 5.1 million, with a total margin of error of about 400,000. Gerald Reitlinger, *The Final Solution* (New York: Beechhurst, 1953), p. 501. More recently, Lucy Dawidowicz has placed the death toll at over 5.9 million. Lucy S. Dawidowicz, *The War against the Jews* (New York: Holt, Rinehart & Winston, 1975), p. 403. To some degree, the differences in such estimates reflect the difficulty of determining what "natural" mortality would have been during Hitler's occupation of continental Europe. See William Petersen, *Population* (New York: Macmillan, 1975), pp. 734-40. Yet the fact that hundreds of thousands of human beings have apparently disappeared from mankind's ledgers and remain totally untraceable also speaks to the nature of this crime against humanity.
8. *Pravda* (January 19, 1939). I am grateful to Robert Conquest for this reference. Kraval himself made an inadvertently prophetic prediction in the pages of *Pravda* (December 23, 1936): "The census will be of great international significance, for its results will attest to the entire world of the immense achievements of socialism in our nation."
9. One review of the suppressed census suggests that the difference may have been in excess of 25 million. See W. von Poletika, "Annullierte Volkszählung 1937 und Bevölkerungsstand in der Sowjetunion," *Allgemeines Statistisches Archiv* 28 (1939):322-56.
10. See Morris D. Ullman, "The 1939 USSR Census of Population: Organization and Methology, with Notes on Plans for the 1959 Census of Population," mimeograph, Foreign Manpower Research Office, U.S. Bureau of the Census, May 1959. I am indebted to Rosemarie Crisostomo for bringing this source to my attention.
11. Murray Feshbach, "Between the Lines of the 1979 Soviet Census," *Problems of Communism* 23 (January-February 1982):27-37, touches upon some of these questions.
12. B. T. Urlanis, "Trends in Fertility Level in the Union of Soviet Socialist Republics during the Years of Soviet Rule," *Population Bulletin of The United Nations* 13 (1980):54.

13. Alan S. Milward, *War, Society, and Economy, 1939–45* (Berkeley: University of California Press, 1977), p. 92. It would be inane to blame Stalin and the CPSU for the Nazi invasion. Yet one must recognize that Stalin's international maneuverings increased the chances of war in Europe in 1939, even as it was well known to Soviet intelligence services that Hitler's war aims included eventual annexation of the Ukraine, and that Stalin's successive purges of the Red Army left it in a very much weaker state than it need have been in the face of the Wehrmacht. On the former, see John Lukacs, *The Last European War* (Garden City: Anchor Press/Doubleday, 1976), pp. 29–32, 40–46, 54–70, 102–6; on the latter, see Ulam, pp. 282–313.
14. Details of this controversy may be gleaned from Steven Rosefielde, "An Assessment of the Sources and Uses of Gulag Forced Labour, 1929–56," *Soviet Studies* 33 (1981):51–87; and the rejoinder by S. G. Wheatcroft, "On Assessing the Size of Forced Concentration Camp Labour in the Soviet Union, 1929–56," *Soviet Studies* 33 (1981):265–95.
15. See Conquest, pp. 709–10; and idem, *Kolyma: The Artic Death Camps* (New York: Oxford University Press, 1979),pp. 214–31.
16. The extent to which the Soviet Union has evolved politically (or as some Western observers would have it, "reformed") since Stalin's death is an important, complex, and often hotly contested subject. It is impossible to render final judgement on the transition from Stalinism to Khrushchevism and on into the era of Brezhnev in a few sentences. Knowledgeable observers will concede that a variety of interpretations are feasible, even if these do not coincide with their own evaluations. Without presuming to be definitive, let me suggest that a country's workings are often illuminated by the circumstances of those groups at the respective poles of the social spectrum. At the top, we see an apparat which over the past thirty years has been greatly expanded in numbers, freed from the Terror, and allowed to avail itself of material comforts which only a generation ago would have been either unattainable or too dangerous to enjoy. Despite these unarguable improvements, there is evidence that members of the apparat do not feel that life has become gayer. Alcoholism has apparently risen to near-epidemic proportions, lifespans have been falling, and according to both émigrés and Western observers, the priviledged classes' outlook toward the future has shifted decisively, from guarded optimism to unmistakable pessimism. At the bottom, we see the condition of the suppressed "races"—Crimean Tatars, the Ingush, and such Soviet creations as the Meskhetian nationality. Nearly forty years after the Soviet victory against the Nazis, these groups, each of which was condemend *as an entire people* for alleged collaboration, still seem to be treated as criminals by birth. Even today, they are effectively forbidden to leave their "settlements," seek higher education, or even talk with foreigners without fear of official retribution. Since Stalin's death, patterns of development and decay have become increasingly pronounced; yet it would be difficult to represent these changes as reform, at least in the sense that

students schooled in the values of the Enlightenment use the term. As the Brezhnev era passes it will be interesting to see whether the Soviet political tradition can come to terms with reform, however hesitant.

17. I have relied on the *Chronicle of Current Events,* as translated by Amnesty International, to detail the entire Dyadkin affair.

1.
Has No One Been Forgotten?

After the Twentieth Party Congress in 1956, rather comprehensive and allegedly unbiased statistical tables on demography, economics, the social composition of the population, and other subjects began to be published in the USSR. However, these official tables are incomplete and at times inaccurate. In officially issued demographic-statistical materials there continues to appear a systematically dishonest approach even to those statistical materials that have already been published.

As the newest (1976) and typical example I would like to cite two cases in an article written by demographer G. M. Maksimov (Bibliography, no. 2).[1] The first two pages of the article deal with population losses as a result of World War I, the Civil War, and World War II, but somehow the losses suffered during 1929–36 have been conveniently "left unnoticed." Maksimov presents the following data (see Table 1.1) to show the dynamics of the Soviet population and includes figures previously published by the Central Statistical Bureau (TsSU) of the USSR. Even in this table a somewhat unnatural selection is made—no population figures are given for the years 1922, 1924, 1928, 1937, 1940, and 1950–58, which were previously published in numerous collections issued by the TsSU (see for example Bibliography, no. 5).

Maksimov compares the "victorious" period of the building of socialism with World War I and the Civil War as follows: "It is noteworthy that during the years of World War I and the Civil War (from 1914 to 1920) the population of our country decreased by 4.8 million. During the six war years the country lost 21 million as a result of war action, the imperialist blockade, and a drop in the birth rate." Regarding World War II casualties Maksimov states: "During the Great Patriotic War of 1941–45 against the German fascist invaders, the Soviet people heroically defended the independence of their socialist homeland, destroying Hitler's hordes and saving the peoples of other coun-

TABLE 1.1
Dynamics of the Soviet Population

		In millions
1897	Jan. 28 census, within current USSR boundaries	124.649
1913	End of year estimate, within current USSR boundaries	159.153
1913	End of year estimate, within 1924–39 USSR boundaries	139.313
1920	Aug. 28 census, within 1924–39 USSR boundaries	136.810
1926	Dec. 17 census	147.028
1939	Jan. 17 census, within 1924–39 USSR boundaries	170.557
1939*	Jan. 17 census, within current USSR boundaries	190.678
1959	Jan. 15 census	208.827
1970	Jan. 15 census	241.720
1975	Estimate for Jan. 1	253.261

*Includes estimates for Western Ukraine, Byelorussia, Moldavia, Lithuania, Latvia, and Estonia (ed.).

tries from fascist enslavement. Our country suffered heavy losses in human lives during this war—over 20 million people perished. The birth rate fell sharply in those years and the death rate increased."

The demographer conceals the methodology used in calculating both losses. It is necessary to proceed on our own from the cited figures to the methodology, in order to reveal the mechanism of "two truths." We will use the accepted demographic methodology applied in population projection by using the formula:

$$^{t}P = C \cdot e^{pt}$$

where immigration and emigration are ignored and where
C = population in a given base year;
^{t}P = population in t years;
t = time expressed in years;
p = natural annual rate of growth (constant);
e = natural logarithms.

Applied to the 17-year period from 1897 to 1913, the above formula yields the mean annual rate of growth:

$$p = \left(1n \frac{^{t}P}{C}\right) t.$$

Substituting the values in Maksimov's table we derive:

$$p = \ln \frac{159.153}{124.649} \div 17 = 14.4‰ \text{ [per thousand]}$$

Even at this juncture it becomes quite obvious that the TsSU figures and Maksimov's data for the base prerevolutionary years (for example for the end of 1913) are inaccurate and have clearly been lowered, since the same TsSU figures for the natural average annual rate of growth before World War I were much higher—16.4–16.8% (Bibliography, no. 4). We do not purport to investigate losses for the years 1914–20, and are therefore not concerned with accurate figures for that period, only with an evaluation. But let us assume that both Maksimov and the TsSU indicated the lowest base population figure for the end of 1913 and that the TsSU 16.4 per thousand annual rate of increase is also the lowest. Now, let us apply these data to estimate the population loss within pre–World War II Soviet boundaries for the period 1914–20. In view of the fact that the figures in Maksimov's table refer to the end of 1913 and August 28, 1920, the interim period involved equals 6.67 years. The base population within Soviet boundaries was 139.313 million, and 6.67 years later we find a figure of 136.810 million for the same territory. However, the hypothetical figure for August 28, 1920 without World War I and the revolution would have been:

$$P_{1920} = 139.313 \times e^{0.0164 \times 6.67} = 155.417 \text{ million.}$$

There were 136.810 million. The losses came to 18.6 million. This figure approximates Maksimov's 21 million, although it is 11% lower. It is possible that the small discrepancy occurs either because Maksimov lowered the total population figure for the end of 1913 or inconspicuously used data that did not appear in his table regarding greater losses in the years 1914–20. Nevertheless, Maksimov's calculation in accordance with which 21 million people were lost during 1914–20 falls in line with commonly accepted demographic methods, but his methodology totally falls apart in the calculation of losses during World War II, 1941–45. Let us use his incomplete table and apply the same calculation technique.

Assuming that for the period 1939–45 t = 7 years and p = 16.8‰ for the peaceful period (which, as we shall see below, is substantially lower than the real natural rate of population increase for 1937–39, which varied from 19.2 to 20‰—see Table 1.2), and if C in 1939 was 190.678, we derive with the help of the same formula P_{1946} = 214.473 million. This should have been the size of the population in the beginning of 1946 without the Soviet/Finnish War and World War II. Now we shall derive the approximate real population figure for the period 1946–58. After 1950 and until 1959 the average natural annual rate of increase was much higher than 16.8‰ (with the exception of 1953, when the growth rate was 16.0‰—see Table 1.2). Before 1950 the natural growth rate could have been lower, but not significantly, because of a post-World War II baby boom. Therefore, we shall resort once more to the annual growth rate of 16.8‰ as a conservative variable for 1946–58.[2] Using t = 13 years, P_{1959} = 208.827 million, we arrive at 1946 C = 167.856 million instead of 214.473 million for the beginning of 1946.

The deficit amounts to 46.617 million people. If we were to accept for 1939–45 the lower natural growth rate for the semiwar year of 1940—13.2‰ (see Table 1.2)—we would hypothetically arrive at a figure of 209.136 million for 1946. Even if we assume that the annual growth rate in 1946–58 was 16‰ (that is, the growth rate for 1953), we come up with a minimum of 169.611 million people. It follows that at the most conservative level of calculation, approximately 40 million people are missing for 1939–45. This is twice Maksimov's figure.

I will present more detailed calculations in chapter 7. The preliminary estimate of 40 million encompasses not only losses but also the unborn, because of a decline in the birth rate. Thus, Maksimov's first distortion is due to his comparison of nonequivalent values such as "human losses" (his terminology) of 1914–20, which he defines as those killed and those unborn because of war conditions, and "population losses" of 1941–45, which he does not define (although the context seems to imply that reference is made only to those killed). I also presume that his words "more than," when applied to the 20 million, are vague and do not indicate how much "more than" 20 million they could mean—perhaps even 40 million. There is a second point: the officially announced losses of 20 million people (derived from an offhand remark by Nikita Khrushchev in a letter to the Swedish prime

TABLE 1.2

Birth Rate, Death Rate, and Rate of Population Growth ‰. Infant Mortality Rate (deaths prior to one year of age ‰ births).

Year	Born	Died	Increase	Deaths prior to one year of age
1913	47.0	30.2	16.8	273
1913	47.5	29.1	16.4	269
1926	44.0	20.3	23.7	174
1928	44.3	23.3	21.0	182
1937	38.7	18.9	19.8	170
1938	37.5	17.5	20.0	161
1939	36.5	17.3	19.2	167
1940	31.2	18.0	13.2	182
1950	26.7	9.7	17.0	81
1951	27.0	9.7	17.3	84
1952	26.5	9.4	17.1	75
1953	25.1	9.1	16.0	68
1954	26.6	8.9	17.7	68
1955	25.7	8.2	17.5	60
1956	25.2	7.6(?)*	17.6	47
1957	25.4	7.8	17.6	45(?)*
1958	25.3	7.2	18.1	41
1959	25.0	7.6	17.4	41
1960	24.9	7.1	17.8	35
1961	23.8	7.2	16.6	32
1962	22.4	7.5	14.9	32
1963	21.2	7.2	14.0	31
1964	19.6	6.9	12.7	29
1965	18.4	7.3	11.1	27
1966	18.2	7.3	10.9	26
1967	17.4	7.6	9.8	26
1968	17.3	7.7	9.6	26
1969	17.0	8.1	8.9	26
1970	17.4	8.2	9.2	26
1971	17.8	8.2	9.6	23
1972	17.8	8.7	8.9	26
1973	17.6	8.7	8.9	26
1974	18.0	8.7	9.3	29

Sources: Bibliography, nos. 5, 6.

*Question marks in tables indicate illegibility in *samizdat* copy.

minister at the end of 1961: "The war took 20 million Soviet lives"[3]) are also falsified.

The most blatant reshuffling of figures in Maksimov's work and in all analogous demographic data provided by the TsSU is reflected in the use of the 3.5 million average annual increase for the end of the 1920s and the 2.5 million average annual natural increase for the 1930s, which cover up the losses and yield a 2 million average annual increase above the losses. This technique is used to conceal the large-scale annihilation of the population in 1926-39. It turns out that the dynamics of the country's population growth cannot reflect forced collectivization, famine, the Gulag, and the executions in the official data.

Notes

1. For a complete list of official statistical data published after 1956, see Ye.A. Mashikhin and V.M. Simchera, "Statistical Publications in the USSR," *Bibliograficheskiy ukazatel* (Moscow, 1975): 62-63, 102, 107, 108; and the TsSU periodical *Vestnik statistiki.*
2. In 1949 the increase in the birth rate was 28.5‰—higher than in 1950-58. In 1947 it was 25.7‰—higher than in 1953, 1956, 1957, and 1958. See *Zhenshchiny v SSSR (Women in the USSR), Statisticheskiy sbornik* (Moscow, 1975):101 (ed. note).
3. See *Mezhdunarodnaya zhizn* (Moscow, no. 12, 1961):8.

2.
Basic Sources

Since 1956 the Central Statistical Bureau (TsSU) of the USSR has been publishing the yearbook *Narodnoye khozyaystvo SSSR (The National Economy of the USSR)* and other source materials on union and autonomous republics, regions, and areas. These publications contain a variety of statistical information, including demographic data, not only for the year in question, but for some past years as well, although with substantial chronological gaps and omissions. For example, an entire period such as 1929–36 is simply omitted. These data are accessible to any scholar. I am neither a demographer nor a historian but my familiarity with mathematical methods has allowed me to perform the necessary calculations routinely used in demography. To make the accuracy of the results verifiable, I have made a consistent effort to explain my calculations. In addition, every variable has several estimates; therefore a possible range of values is also given.

More than forty years have passed since the period of collectivization. Yet complete silence surrounds the annihilation of the *kulak*[1] and sub-*kulak* population (terms used to designate the peasantry in Soviet literature). Neither do we find any mention of other victims of reprisals, who bore other labels. For a long time casualty figures for World War II were hushed up until the figure of 20 million emerged from obscurity, its origin unknown. The Soviet/Finnish War casualties had fallen into oblivion after Vyacheslav Molotov announced a fantastically low 45,000 figure.[2] In his memoirs published in the West, Nikita Khrushchev refers to one million losses, but his statement is most likely corroborated by statistical data. The losses for each year during the 1941–45 war period are missing and, of course, nothing is said about casualties resulting from major military operations. Unexpectedly, an article would mention that over 500,000 party members and candidates were killed only in the initial six months of 1941 and that 1,400,000

Communists perished during an eighteen-month period in 1941-42.[3] But what about the millions of rank-and-file citizens, the nonparty people who died during the same early months of the war? They are not accounted for separately, broken down according to years. Only the knowledge of war casualties suffered by both sides, Soviet and the German, in each of the major operations, could provide an answer to the question as to what price had to be paid by the Soviet population for victory. Now, in the last quarter of the twentieth century we must ask ourselves this question: Given the number of losses in human lives, was this truly a victory?

Throughout the book I have provided original tables drawn from published data. These tables are designated by numbers. Tables derived from the originals and converted are designated by letters. It should be stressed that the TsSU does its best to obstruct research. Demographic and economic tables which appear in one yearbook disappear in other issues. The same "condemned" periods are not included: moreover, even in tables of the same type, information on some years is occasionally missing. That is why several yearbooks have to be consulted, not just the latest editions, in order to find the needed information.

Notes

1. The official Soviet definition of a *kulak* is "a wealthy peasant landowner who exploits other peoples' labor, especially the poor" (ed.).
2. Vyacheslav M. Molotov, "Foreign Policy of the Government," Report of the Sixth Session of the Supreme Soviet of the USSR, Moscow, March 29, 1940, pp. 11, 14 (ed.).
3. L.M. Spirin, "Party and Komsomol Induction into the Red Army during the Great Patriotic War," *Voprosy istorii KPSS* (Moscow, no. 3, 1963):36.

3.
Population Losses during the "Class Elimination" Period of 1929–36

Table 3.1 shows the population of Russia from 1897 to the present. For the Czarist period information is provided only for the years 1897 and 1913. World War I accounts for a four-year gap. There are also minor omissions in the total population count for 1917–29. An eight-year blank in information then follows. Statistical data was resumed for 1937–40, after which there was a ten-year gap: the Great Patriotic War (World War II) and the initial postwar years. Annual total population figures are given since 1950.

The available information is satisfactory but not exhaustive. The selection of years for which data are provided reflects a demographic disaster in the nonwar period between 1929 and 1936, which is comparable to the war casualties and greatly exceeds the losses between 1937 and 1940. Using the difference in the population figures for the years in Table 3.1, we deduce the absolute population increase for the relevant three years. By dividing that figure by the corresponding time interval, we arrive at the average annual increase. The results as shown in Table A call for the following comments.

From 1921 to 1923 the population declined by 0.7 million people. The Civil War, famine in the Volga region, and emigration are probable causes of this decrease. However, by 1923 there was an initial modest increase of 1.5 million people. From 1924 to 1926 the population increase was a normal 9.4 million—an average of 3.1 million annually. With this 2.3% yearly growth rate it exceeded that of 1897–1913, which we estimated as 1.6–1.7% (see chapter 1).

During the New Economic Policy (NEP), which was a stepping-back period for the government for the purpose of regrouping, there was a population increase of 6.4 million during 1927–28, or 3.2 million a year. It shows a good stability in the absolute population increase which

TABLE 3.1
Total Male and Female Population (in millions)

	Year	Total	Male	Female	Year	Total*	Male	Female
	1897	124.65	62.0	62.6	1956	197.90	88.5	109.4
Dec.	1913	159.15	79.1	80.1	1957	201.41	90.2	111.2
Dec.	1913**	139.31			1958	204.92	92.0	112.9
	1917	163.00			1959	208.83	94.0	114.8
	1919	138.00			1960	212.37	96.0	116.5
Aug.	1920	136.81	65.3	71.5	1961	216.29	97.9	118.4
Dec.	1922	136.10	65.0	71.1	1962	220.00	99.9	120.1
	1924	137.60			1963	223.46	101.7	121.8
Dec.	1926	147.03	71.0	76.0	1964	226.67	103.4	123.3
	1929	153.41			1965	229.63	104.9	124.7
	1937	163.77			1966	232.24	106.3	125.9
	1938	167.05			1967	234.84	107.7	127.1
	1939**	170.56			1968	237.16	108.9	128.3
	1939	190.68	91.4	99.3	1969	239.46	110.1	129.4
	1940	194.10	93.0	101.1	1970	241.72	111.4	130.3
	1950	178.55	78.4	100.1	1971	243.87	112.5	131.4
	1951	181.60	79.9	101.7	1972	246.29	113.8	132.5
	1952	184.78	81.5	103.3	1973	248.62	115.0	133.6
	1953	187.98	83.3	104.7	1974	250.86	116.2	134.7
	1954	191.00	84.8	106.2	1975	253.26	117.5	135.8
	1955	194.41	86.5	107.9				

Sources: Data from Bibliography, no. 5, are supplemented with no. 2 for 1913 and 1939 and no. 6 for 1940.

*Within boundaries prior to September 1939.

**Population figures refer to the beginning of the year, unless the months are indicated. From 1920 to 1939 population figures are within the same boundaries.

almost equals that in 1937 and 1938 and the postwar increase since 1950. However, the toll of socialism's victory in the countryside and the cities is as follows: in the eight years from 1929 to 1936 the total population increase was 10.4 million or an average of 1.3 million people annually. It is even less than the modest increase in 1923, almost 2.5 times below the annual increase in the last NEP years, and 2.6 times less than the population increase during 1937–39.

Therefore, the demographer Maksimov (see chapter 1) had to inflate the demographically disastrous 1929–36 figures. He did it in a very simple way—by extending this period and including in it not only the statistically more favorable period of 1926–28 but also the figures for

TABLE A
Average Annual Absolute Population Increase (in millions)

Years	Total increase	Average annual increase
August 1921–22	− 0.71	−0.51
1923	1.5	1.5
1924–26	9.4	3.1
1927–28	6.4	3.2
1929–36	10.4	1.3
1937	3.3	3.3
1938	3.5	3.5
1939	3.6	3.6
1940	2.5	2.5
1940–49	−15.6	−1.6
1950	3.0	3.0
1951	3.2	3.2
1952	3.2	3.2
1953	3.0	3.0
1954	3.4	3.4
1955	3.5	3.5
1956	3.5	3.5
1957	3.5	3.5
1958	3.9	3.9
1959	3.6	3.6
1960–64	17.2	3.4
1965–69	12.1	2.4
1970–74	11.6	2.3

the dubious years 1937–38. In this manner he arrived at the annual prewar population increase of 2 million people, which was still inadequate for that period. Moreover, he drew a comparison with England and France.

If we assume that the average annual natural population increase in 1929–36 was the 3.1–3.2 million attained in 1927–28, by 1937 we arrive at a population deficit of at least $3.2 \times 8 - 10.4 = 15.2$. That is, 15 million people were lost, most of whom were peasants, their wives and children, and the clergy. Such losses are not caused by a drastic decline in fertility, as testified by demographic facts that will be quantitatively evaluated in ensuing chapters. At this juncture the following evidence is noteworthy:

1. The decrease of the male population in 1939 as compared to 1926 bears witness of a high level of deaths due to unnatural causes.
2. The unnatural decline in the number of children born in 1924–28 and surviving by 1939 and the relatively small number of boys in the 5–9 age group according to the 1939 population census also indicate the high level of unnatural deaths.
3. The relatively small difference in the number of children born in 1929–33 and 1924–28 living at the time of the 1939 population census shows that the decrease in the birth rate was minor.

We shall prove that the reasons for the high absolute population growth in 1937–38 ("high" compared to the years of collectivization) are not to be found in the low death rate due to unnatural causes but are due to the stable decrease of the natural death rate. Taking this into consideration, the population deficit by the end of 1936 would amount to approximately 20 million people. In order to infer to what extent the population decrease was due to the death rate and to what extent it resulted from a decrease in the birth rate, we will have to restore certain unpublished data by means of calculation.

4.
Male Losses during Peacetime (1926–40, 1950–54) and the Gulag Population and Prison Death Rate (1950–54)

We shall investigate the male/female ratio in Tables 3.1 and 4.1. In 1897, 49% of the population was male and 51% female. By 1913 the male population increased to 49.7%, despite the Russo/Japanese War and the 1905 revolution. Since that time, the level of male population has never reached such height in the USSR, neither at present, nor has it ever again attained even the 1897 level.

After World War I, the revolution, and the Civil War, the male population declined, and in 1922 it amounted to 47.7%. Between 1913 and 1920 the number of males within the boundaries prior to 1939 decreased by 13.8 million and the number of females by 8.6 million. At least 4 million more males died than females (the figure is very approximate). Later the male population showed a tendency to increase, which is usual for normal times, reaching 48.3% by 1926. Two factors were instrumental for the increase: (1) A biological aspect—the birth rate for boys was higher. As shown in Table 4.1, in 1897 the number of births for boys was 51.3% (±0.1%) and for girls 48.7% (±0.1%). (2) A consequence of war—the increased share of females in the higher age brackets due to natural deaths in that group. The only factor preventing the share of females from declining is their longer average life span—probably a result of both social and biological variables.

During peacetime the first two factors outweigh the third, as was the case in 1922–24 and throughout all the years since 1957. And that is the way it should have been from 1926 to 1939. However, during the latter

TABLE 4.1
Population and Birth Pattern in the USSR by Sex

Year	% of total population		% of total born	
	Men	Women	Boys	Girls
1897	49.0	51.0	51.3	48.7
1913	49.7	50.3	51.2	48.8
1926	48.3	51.7	51.6	48.4
1939	47.9	52.1	51.4	48.6
1940	47.9	52.1	51.3	48.7
1950	43.9	56.1	51.4	48.6
1951	44.0	56.0	51.4	48.6
1952	44.1	55.9	51.4	48.6
1953	44.3	55.7	51.4	48.6
1954	44.3	55.6	51.3	48.7
1955	44.5	55.5	51.4	48.6
1956	44.7	55.3	51.4	48.6
1957	44.8	55.2	51.4	48.6
1958	44.9	55.1	51.3	48.7
1959	45.0	55.0	51.3	48.7
1960	45.2	54.8	51.3	48.7
1961	45.3	54.7	51.3	48.7
1962	45.4	54.6	51.3	48.7
1963	45.5	54.5	51.4	48.6
1964	45.6	54.4	51.3	48.7
1965	45.7	54.6	51.3	48.7
1966	45.8	54.2	51.3	48.7
1967	45.8	54.2	51.3	48.7
1968	45.9	54.1	51.2	48.8
1969	46.0	54.0	51.2	48.8
1970	46.1	53.9	〃	〃
1971	〃	〃	〃	〃
1972	46.2	53.8	〃	〃
1973	46.3	53.7	〃	〃
1974	〃	〃	〃	〃
1975	46.4	53.6	〃	〃

Sources: Bibliography, nos. 5, 6.

period the share of males dropped from 48.3% to 47.9%, and in 1940 there was still no increase. This unnatural situation was aggravated by World War II, when the share of males declined below 44% and increased up to 46.4% only by 1976. These figures are omitted from the data on total population (see Table 3.1) for 1924, 1929, 1937, 1938, and

1939 within the pre-September 1939 boundaries. An analysis similar to mine has already been done and I can only say without regret that I am not the original discoverer of demographic anomalies. The blanks complicate the problem but do not make it impossible to provide an answer to the question: What percentage of males should there have been in 1939? The initial approximate estimate may be derived by the following method:

1. The percentage of males increased by 0.54% from the end of 1922 to the end of 1926 (see Table 3.1). If such a rate were sustained it could have increased by $0.54 \times 12/4 = 1.6$ yielding 49.7% during 1927–39.
2. A rough estimate of the variation may be made by comparing the growth rate of males from a lower level. In the twelve years since 1950 it increased according to approximate data (see Table 4.1) by 1.4% and according to more accurate calculations (see Table 3.1) by 1.35%. Moreover, it may be made from a higher level which approximates the biological barrier of the birth rate of boys: in 1897–1913 it increased by 0.7% within sixteen years and therefore could have increased by 0.5% within twelve years.

Instead of an expected increase of 0.5–1.6%, the share of male population declined by 0.4%. Thus a substantial number of males within an 0.9–2% growth range is missing. Applying these data to a 170 million population in 1939, we conclude that during 1927–39 the number of male deaths exceeded the female by 1.5–3.4 million.

Let us examine the percentage of males in the total population by referring to the difference in the absolute increase in the number of males and females. For the sake of convenience we shall refer to that difference as the excess increment in the male population or just "excess increment," the term *excess* being used algebraically (i.e., in the case of a deficit, we shall consider it negative). To that end we shall calculate the absolute increase in the number of males and females in individual years and over a number of years (see Table 3.1), derive the relevant differences, and adduce the results inTable B. Thus the number of males in 1939 was 91.4 million against 99.3 million for females, whereas in 1940 there were 93 million males and 101.1 million females, yielding an increase of 1.6 million males and 1.8 million females in 1939. Thus we derive a figure of -0.2 million males (i.e., a deficit).

Table B shows that the excess increment in the male population sub-

TABLE B
Absolute Increase of Males and Females
(years for which these data have been published)

Year	Males	Females	Difference	Years	Males	Females	Difference
1939	1.6	1.8	−0.2	1922–26	6.0	4.9	+ 1.1
1950	1.5	1.6	−0.1	1927–38	20.4	23.3	− 2.9
1951	1.6	1.6	0	1940–49	−14.6	1.8	−16.4
1952	1.8	1.4	+0.4	1950–54	8.1	7.8	+ 0.3
1953	1.5	1.5	0	1955–59	9.5	8.6	+ 0.9
1954	1.7	1.7	0	1960–64	8.9	8.2	+ 0.7
1955	2.0	1.5	+0.5	1965–69	6.5	5.6	+ 0.9
1956	1.7	1.8	−0.1	1970–74	6.1	5.5	+ 0.6
1957	1.8	1.7	+0.1				
1958	2.0	1.9	+0.1				
1959	2.0	1.7	+0.3				
1960	1.9	1.9	0				
1961	2.0	1.7	+0.3				
1962	1.8	1.7	+0.1				
1963	1.7	1.5	+0.2				
1964	1.5	1.4	+0.1				
1965	1.4	1.2	+0.2				
1966	1.4	1.2	+0.2				
1967	1.2	1.2	0				
1968	1.2	1.1	+0.1				
1969	1.3	0.9	+0.4				
1970	1.1	1.1	0				
1971	1.3	1.1	+0.2				
1972	1.2	1.1	+0.1				
1973	1.2	1.1	+0.1				
1974	1.3	1.1	+0.2				

Excess increment of males during 1950–54: 0.3 ± 0.06 million.

Average five-year excess increment of males during four five-year periods from 1955 to 1974: 0.775 ± 0.13 million.

stantially fluctuates from year to year. During the course of the normal years after 1956 it was changing from 0 to +0.4, and most frequently it was either 0.1 or 0.2 million, but—and this is noteworthy—it never fell to a negative level as was frequently the case in preceding years. However, within a five-year period these fluctuations in the excess increment are less pronounced. It is manifested during demographically favorable periods. Since 1955 the excess increment is not only favorable to males but changes from 0.6 to 0.9 (i.e., no more than by 20% from the middle of the 0.75 ± 0.15 million range). During 1927–39 it is negative (−2.9 million). Considering these characteristics of the excess increment we shall derive the deficit in the male population by 1939 by estimating:

a. The excess increment in the male population and the standard deviation of this value during the five-year periods since 1955.
b. The value and error of the excess increment (in the male population) within the old 1939 boundaries.
c. The hypothetical positive excess increment in the male population which should have taken place from 1927 to 1939. This is estimated by using the 1922–27 data and recalculating them in proportion to the total population increase.

By deducing the real excess growth from the hypothetical estimate we derive absolute figures of male and female deaths. The error is calculated according to the results obtained for (1) and (2) above. Calculation (a) above is based on the following commonly used method: assuming that the quantity of a given value (population, number of males, excess growth, etc.) equals $b_1, b_2 \ldots, b_n$, we arrive at a mean quantity of $S = 1/n\ (b_1 + b_2 + \ldots b_n)$. The error is estimated as the standard deviation according to the formula:

$$\epsilon = \sqrt{1/n\ [(S - b_1)^2 + \ldots + (S - b_n)^2]}.$$

The latter is applicable when the deviations $s - b_1$, $s - b_2$, ... are normally distributed and independent. In order to create such conditions the excess increments are grouped in five-year periods, since the sum of random values approaches the normal distribution even if each random value substantially deviates from the normal distribution. In our case we are concerned with the difference between the absolute growth of the number of males and females in the four favorable five-

year periods from 1955 to 1975. Using the numbers b_1, b_2, b_3, and b_4 from the last column of Table B we get $S = 0.775$ million, $\epsilon = 0.13$ million. Thus the standard deviation of the excess increment equals $0.13/0.775 \times 100 = 17\%$ of its value (differing only slightly from the above maximum variation estimate).

With regard to calculation (b): Tables 3.1 and 4.1 contain the total number and share of males for the territory that includes the western provinces. I have been unable to find statistical data that do not include the latter. It may be reasonably assumed that inasmuch as in western Ukraine, western Byelorussia, Moldavia, and the Baltic republics entire classes of people were not eliminated until 1939, the share of males in the areas was close to 50%. At any rate, the error will be negligible, assuming that among the 20.1 million annexed people there were 10 million males and 10.1 million females. It corresponds to the 1913 composition of the population in Czarist Russia. Then instead of the excess increment of -2.9 million (see Table B) we shall obtain -2.8 million. Let us estimate the maximum variation of this value, assuming that the share of males living in the annexed territories had reached the Soviet Union's 1926 level. Pursuant to Table 4.1, that share equals 48.3%. With a 20.1 million total population value for the annexed areas we would come to the conclusion that the number of females in the annexed territories exceeded the number of males by 0.7 million, which in turn yields an excess increment of -2.2 million for the population in the original 1939 borders. Thus the excess increment of males in the original 1939 borders is -2.2 to $-2.8 = -2.5 \pm 0.3$ million.

With regard to calculation (c): the excess increment of males in 1922–27 was 1.1 million with an absolute total population increase in 15.9 million within pre-September borders. Consequently, the absolute increase within the same border amounts to 23.6 million from 1927 to 1939 and should produce the excess increment in the male population of $23.6/15.9 \times 1.1 = 1.6$ million. Assuming that this number may contain some error as a result of natural fluctuations (20%), we derive 1.6 ± 0.3 million. Subsequently, the deficit of males versus females equals: $-2.5 \pm 0.3 - 1.6 \pm 0.3 = -4.1 \pm 0.42$ million people. Here we applied the well-known method of estimating the error (ϵ) of the sum or difference of two items each with independent errors ϵ_1 and ϵ_2, thus: $\epsilon = \sqrt{\epsilon_1^2 + \epsilon_2^2}$.

The earlier estimate of the deficit in the male population from -1.5 to -3.4 million is not at variance with -4.1 ± 0.4, but the latter

should be considered more accurate inasmuch as it was derived by direct analysis of the difference in the increase of males and females (i.e., values whose order is close to the unknown, whereas the initial estimate was based on the percentage of males in the total population and was calculated as the small difference of large values which is always less accurate). The 4-million deficit in the male population includes all deaths during the 1937–38 purges and some of the peasants and prisoners who died before 1937. (This assumes that those who perished in 1937–40 were almost exclusively males, unlike those who died during 1929–36.)

The high mortality rate of males during the postwar years is because the majority of labor camp prisoners were men. We shall verify by demographic methods the accuracy of Solzhenitsyn's statements regarding the terrible conditions in labor camps and the vastness of the Gulag population. Table B enables us to assess the Gulag phenomena during the less violent years from 1950 to 1954. In 1951, 1953, and 1954 the increase in male population did not exceed the female. In 1950 it was below and only in 1952 above that level. Throughout all five-year periods the excess increase of males amounted to a mere 0.3 million, as against 0.9 million in the following five-year period and compared to 0.6–0.9 million during each of the subsequent four-year periods. Thus it fell below the natural increase by 0.3–0.6 million.

We may wonder whether the small value of 0.3 million of the excess increase of males in 1950–54 is not due to coincidence. To make a quantitative assessment of the ominous character of that value we shall show that the birth rate was normal and the basic biological factor—a higher birth rate for boys—accounted for a slightly larger total average excess increase of boys in 1950–54 and in subsequent five-year periods. An absence of anomalies in the birth rate accompanied by an increase in infant longevity, simultaneously accompanied by a reduction in the increase of males, proves that there was an unnaturally high death rate among adult males. Table 4.2 shows that in accordance with the 1959 census there was approximately a 4% preponderance of boys in the 0 to 4-year age bracket (born 1949–58, as well as in the two groups born 1949–53 and 1944–48), equaling 1,040, 1,035, and 1,037 respectively per 1,000 girls. Pediatricians tried to take good care of childrens' health and lives.

Now let us compile Table C. Here we compare excess increment of boys (d) with excess increment of males. Value *d* is computed as follows.

TABLE 4.2
Male/Female Ratio According to 1939, 1959, and 1970 Censuses
(number of males ‰ females)

	1939	1959	1970
Total population	921	819	855
by age group			
0-4	1020	1040	1036
5-9	997	1035	1039(?)
10-14	1004	1037	1038
15-19	970	1006	1042
20-24	937	976	1018
25-29	953	962	979
30-34	988	829	959
35-39	875	641	963(?)
40-44	867	624	856(?)
45-49	833	623	631
50-54	828	623	607
55-59	656	502	562
60-69	683	537	507
70-79	618	487	454
80-89	517	417	378
90-99	465	326	316
over 100	573	334	282

Source: Bibliography, no. 1.

In Table 1.2 (column 1) we find the total number of newly born infants (m) per thousand of population. Multiplying *m* by *A* (total population for a given year) and dividing it by 1,000, we get the number of newly born infants mA/1,000 in millions. Table 4.1 shows the percentage of boys m_m and girls m_g in the newly born population. Evidently, the number of newly born infants should be multiplied by the difference $m_m - m_g$ and divided by 100, to arrive at value *d*. The resultant formula, which should reasonably consider losses due to infant mortality before the age of 12 months (as shown in the last column of Table 1.2, and designated as *k*), comes out as follows:

$$d = \frac{m_m - m_g}{100} \times \frac{mA}{1000}$$

$$(1 - \frac{k}{1000}).$$

After making calculations for each year and totaling the values for five-year periods, we derive the figures in Table C. It follows that:

- The share of newly born infants in the excess increment of males during the initial five-year period under review is 0.65 million—almost identical to each of the following favorable five-year periods (from 0.51 to 0.68 million).
- The excess increment of males during all the favorable five-year periods was higher than that of boys because of the higher female death rate compared with the male. The preponderance of women in the older age brackets is a postwar result.
- The excess increment of males was *twice* as low as the excess increment of boys for 1950–54.

Let us estimate the greater number of males who perished during the first five-year period by subtracting from the average excess increment of males during the favorable five-year periods (equal in Table B to 0.77 ± 0.13 million) the comparable figure for 1950–54. It is reasonable to assume that the latter figure fluctuates at the same level (approximately 20%) as during the more favorable five-year periods (0.3 ± 0.06). This in turn means that the number of male deaths exceeded that of females by: 0.77 ± 0.13 − 0.3 ± 0.06 = 0.47 ± 0.15 million. The possibility of error is calculated in the same manner as previously

TABLE C
Pattern of Excess Increment of Males during Five-Year Periods after 1949 (in millions)

5-year periods	Excess increment		Approximate preponderance of female over male deaths
	men	boys	
1950–54	0.3	0.65	−0.35
1955–59	0.9	0.68	+0.22
1960–64	0.7	0.59	+0.11
1965–69	0.9	0.51	+0.39
1970–74	0.6	0.51	+0.09

TABLE 4.3
Death Rate According to Age
(number of deaths in corresponding age groups, ‰)

	1896–97	1926	1938–39	1958–59	1966–67
Total population by age group	32.4	20.3	17.4	7.4	7.5
0–4	13.2	78.9	75.8	11.9	6.9
5–9	12.9	7.3	5.5	1.1	0.8
10–14	5.4	3.1	2.6	0.8	0.6
15–19	5.8	3.7	3.4	1.3	1.0
20–24	7.6	5.5	4.4	1.8	1.5
25–29	8.2	6.1	4.7	2.2	2.0
30–34	8.7	6.3	5.4	2.6	2.6
35–39	10.3	7.5	8.8	3.1	3.4
40–44	11.8	9.0	8.1	4.0	4.1
45–49	15.7	10.9	10.2	5.4	5.3
50–54	18.5	14.0	13.8	7.9	7.9
55–59	29.5	18.1	17.1	11.2	11.3
60–64	34.5	24.7	24.5	17.1	17.4
65–69	61.6	36.5	35.1	25.2	25.9
70 & over	89.0	79.5	78.9	63.8	66.1

Source: Bibliography, no. 7.

described in this chapter. Dividing that result by 5 we come to the conclusion that at least 94,000 prisoners (with an accuracy of up to 30,000) died annually between 1950 and 1954.

We can use this number (which equals the number of prisoners multiplied by their death rate) in estimating the total Gulag population of that period. At this juncture we have to work with two assumptions: (1) There were almost no executions during the Beria period of 1950–54, and the prisoners died only from hard labor and inhuman living conditions. It may be assumed that the mortality rate was approximately 5 to 10 times higher in the camps than among the general population in the country. (2) The majority of the camp population was 14–50 years old.

According to Table 4.3,[1] the death rate in 1958–59 among the general population was approximately 3‰. Therefore, it should range from 15 to 30‰ for prisoners. Dividing 94,000 by 15–30‰, we derive that the average annual prison population was 3–6 million.

Let us analyze the consequences of exceeding the limits of the above assumption. Assuming that the death rate among prisoners was less

than five times that of the free population, we arrive at a number of over 6 million prisoners. But if we assume that the Gulag population was under 3 million, it means that the death rate of the prison population was more than ten times that of the free population. This situation prevailed on the eve of the rehabilitation and liberalization process. It is obvious why Soviet officials have nothing to say about the *Gulag Archipelago* and its great author.

Note

1. Dr. Dyadkin has apparently averaged the death rates for men and women for the age cohorts of 15–49 for 1958–59. While this method cannot provide the exact death rate for the adult male population—i.e., ages 15–49—it may provide a reasonable approximation, given the margins of error Dyadkin has worked with (ed.).

5.
Natural Death Rate (1927–40) and Losses from Repression and the Soviet/Finnish War of 1939–40

In the twentieth century natural deaths have been caused by numerous factors and have diminished as a result of medical advances and population growth. At the present level of medicine and hygiene in the Soviet Union, a death rate of 7–8‰ has been achieved for the population as a whole (see Table 1.2). In 1964 the death rate in the Soviet Union attained its lowest level—6.9‰—even lower than in the United States. But since 1964 it has gradually and imperceptibly been rising, probably as a result of modern life: the use of cars, overeating, stress, etc., and the inclusion of more men in the higher age brackets.[1] The sample years 1913–50 are certainly not of minimum mortality. In those years deaths from natural causes were decreasing.

To avoid terminological difficulties, the following definitions are used. In demography the terms *birth rate, death rate,* and *natural increases,* are common usage. In statistics the term *death rate* refers to the number of deaths from all causes ‰ of the population. *Natural increase* is interpreted as the difference between the number of births and deaths. I have referred to it simply as *increase* in view of the fact that for many years it has been far from natural in the common, nondemographic understanding. Mortality is divided into two components: natural causes and other causes, such as repression, privations, war, abnormal working conditions (such as cutting timber in the Gulag, for example), and others.

This distinction is necessary to separate unnatural deaths from regular deaths, particularly in 1937–40, when the war affected all sex and age patterns, and covered up demographic traces of repression in official Soviet publications. Taking into account the increase in the number

of physicians in Russia from 28,000 in 1913 to 155,000 in 1940 (see publications by the TsSU), and the rise in the literacy of the population, it may be reasonably assumed that during the first half of the current century the natural death rate should have been decreasing steadily. This is certainly not the case under conditions of privation and repression. In Table 1.2, the death rate in prewar years is available only for 1913, 1926, 1928, and 1937-40. We shall assume that:

- In 1913 the overall death rate of the population coincided with that of natural causes.
- In 1926 and 1955 they approximately coincided.
- In 1950 the natural death rate was below the overall death rate of 9.7‰ by 0.5‰, agreeing with our death rate estimated among prisoners for these years, which was 9.2‰.
- The fluctuation of the natural death rate may be estimated for the individual years beginning with 1956.

Our task is to interpolate the natural death rate between 1913 and 1950 under the above assumptions. The linear interpolation between 1913 and 1950 does not satisfy these conditions. However, an exponential function $c = e^{(3.41-0.0322t)}$ where c is the death rate from natural causes and t the number of years since 1913, fits well. Table D draws a comparison between the overall death rate (see Table 1.2) with the one calculated according to this formula. Let us estimate the error and possible natural fluctuations of the death rate from natural causes. Inasmuch as we are dealing with an exponential formula, it may yield the same relative error within one year—which in our case is 0.0322 = 3.2%. This is common knowledge and derived from the theory of errors.

As shown in Table 1.2 (column 3), the natural fluctuation in the death rate distorts the pattern of the natural death rate during 1956-64 by no more than 0.4‰, which amounts to an approximate 3% deviation from the average level of those years. Thus the error and natural fluctuations do not exceed a total of 6.2% and the standard deviation is even less—4.2%. We assume that the variation in terms of percentages of the death rate from natural causes calculated according to the above formula equals 5%. To arrive at the number of those perished we deduct the death rate due to natural causes from the overall death rate. The results are reproduced in column 4 of Table D. At the bottom of the table the summary results and standard error are given.

TABLE D
Overall Published Death Rate.
Estimated Death Rate from Natural Causes.
Estimated Number of Unnatural Losses in Prewar Years.

Years	Overall death rate (‰)	Death rate from natural causes (‰)	Estimated number of losses (‰)	Estimated number of losses Millions of people
1913	30.2	30.2	0	0
1924		2.3 ± 1.1		
1926	20.3	19.9 ± 1.0	0.4 ± 1.0	0.6 ± 0.15
1928	23.3	18.7 ± 0.9	4.6 ± 0.9	0.68 ± 0.14
1930		17.5 ± 0.8		
1932		16.5 ± 0.8		
1934		15.5 ± 0.7		
1936		14.5 ± 0.7		
1937[1]	18.9	14.1 ± 0.7	4.8 ± 0.7	0.79 ± 0.13
1938[1]	17.5	13.7 ± 0.7	3.8 ± 0.7	0.63 ± 0.10
1939[1]	17.3	13.2 ± 0.7	4.1 ± 0.7	0.78 ± 0.14
1940[1]	18.0	12.7 ± 0.6	5.3 ± 0.6	1.03 ± 0.12
1950	9.7	9.2		
1955	8.2	7.8		

1. In 1937–38, 1.42 ± 0.16 million perished. In 1939–40, 1.81 ± 0.18 million perished. The total number of people who perished in 1937–40 was 3.23 ± 0.25 million.

Thus in 1937 and 1938 the number of Soviet citizens that perished was approximately 1.4 million, with an accuracy of ±0.16 million. Most of them were party officials. In 1939 and 1940, approximately 1.8 million people died as a result of the Soviet/Finnish War. Using Maksimov's method, we shall verify whether the computed level of the death rate from natural causes is reasonable, as compared with that of the United States. In 1937 we found it to be 14.1‰ for the Soviet Union and 11.3 for the United States.[2] The overall Soviet published death rate for 1937 was 18.9‰.

Notes

1. Currently the Soviet death rate is over 10‰. This reflects in part changes in the age structure. (As in other industrialized nations, the average age in the USSR is rising, but there is also an apparently widespread deterioration of health conditions since 1965.) The Soviet government has not yet given public explanation for the factors which appear to have reduced

male life expectancy by more than four years and female life expectancy by as much as two years since the mid-1960s. One of the possible causes for rising death rates in the adult population is intensified alcoholism. Since 1950 alcohol consumption per capita has risen by 500%, and per capita consumption of hard liquor may now be twice as high as in Scandinavia. See Vladimir G. Treml, "Alcoholism in the USSR," in *Studies in the Soviet Second Economy,* ed. Gregory Grossman (Berkeley: University of California Press, forthcoming). For a broader discussion of the factors of Soviet health problems, see Christopher Davis and Murray Feshbach, *Rising Infant Mortality in the USSR* (Washington, D.C.: U.S. Bureau of the Census, International Studies, Series P 74, June 1980) (ed.).

2. See "North America," *Ekonomiko-statistichesky spravochnik, Mysl* (Moscow, 1969).

6.
Birth and Death Rates from Unnatural Causes (1929–36)

The number of people who were killed in 1928—0.7 million (see Table D)—reminds us once again of the onset of collectivization and the more ominous years after 1928, when people perished regardless of their sex or age. To estimate the number of people killed, it is necessary to reconstruct the birth rate during the period of collectivization, and this is more difficult than estimating the death rate from natural causes during that period.

There is no doubt that the birth rate of the rural population declined as a result of the famine that ensued when the peasants were deprived of their property. Therefore, a linear interpolation of the available birth rate figures in 1928 and 1937 may produce an inflated result which, in turn, would yield a higher number of losses. This too would not comply with our principle of adhering to conservative estimates as to the number of dead. To avoid this we resort to an analysis of the 1939 census (see Table 6.1) which provides data on the various age groups and in turn allows us to calculate not only the total number of children born during 1929–36 and still alive in 1939, but the birth rate as well.

The calculation is complicated by the inclusion of children and adults from the annexed territories in the official data. The second difficulty lies in the use of five-year periods for the different age groups instead of one-year intervals. Finally, and this is the main obstacle, the number of children who died from natural causes and privations between 1929 and 1930 remains unknown. We know that in 1926 and 1928 (see Table 1.2) birth rates did not differ substantially, amounting to 44 and 44.3 per thousand, respectively. In chapter 3 we pointed out that the population increase from 1924 to 1928 was stable—3.1–3.2 million annually. Therefore it will not be wrong to assume that during the entire period

TABLE 6.1
Age Structure of Population

	Population (in millions)			Percentage distribution			
	1939	1959	1970	1926	1939	1959	1970
Total Population	190.68	208.83	241.72	100	100	100	100
Age Groups							
0-4	23.75	24.33	20.51	15.3	12.4	11.7	8.5
5-9	19.76	22.03	24.48	10.5	10.4	10.5	10.1
10-14	24.21	15.34	24.99	14.3	12.7	7.3	10.3
15-19	17.19	16.47	22.00	9.2	9.0	7.9	9.1
20-24	15.79	20.34	17.11	8.4	8.3	9.7	7.1
25-29	18.52	18.19	13.77	8.3	9.7	8.7	5.7
30-34	15.60	19.00	21.14	6.2	8.2	9.1	8.7
35-39	12.96	11.59	16.59	5.8	6.8	5.6	6.9
40-44	9.60	10.41	19.00	4.8	5.0	5.0	7.9
45-49	7.78	12.26	12.26	4.1	4.1	5.9	5.1
50-54	6.63	10.45	9.08	3.5	3.5	5.0	3.7
55-59	5.90	8.70	12.01	2.9	3.1	4.2	5.0
60-69	8.54	11.74	17.60	4.4	4.5	5.6	7.3
70-79	3.56	6.17	8.02	1.7	1.8	2.9	3.3
80-89	0.76	1.58	2.60	0.5	0.4	0.6	1.1
90-99	0.12	0.20	0.28	0.1	0.1	0.1	0.1
over 100	under 0.03 million						

Sources: Censuses of 1926, 1939, 1959, and 1970. See Bibliography, nos. 1, 4 for 1926.

from 1924 to 1928 the birth rate was 44%. Thus the number of children born during this five-year period is:

$$D_{1924\text{-}28} = \frac{44}{1000} (A_1 + A_2 + A_3 + A_4 + A_5)$$

where A_1, A_2 . . . A_5 represent the population in 1924, 1925 . . . 1928 respectively, and can be calculated by interpolating the data from Table 3.1.

Therefore:

$D_{1924\text{-}28} = 44/1000\ (137.6 + 140.7 + 143.8 + 147.0 + 150.2) =$ 31.7 million. We have determined the number of children born in 1924–28—who were 10–14 years old at the beginning of 1939. This is the basic point of departure, included in Table E. Children born in 1929–33 were 5–9 years old by 1939, and both age groups survived the

TABLE E
Birth Rates during the Years of Collectivization (Lower Limits) and Related Years.

Year of birth	Survivals in 1939 (in millions) With annexed territories	Without annexed territories	Births (in millions)	Average annual birth rate (‰)
1924–28	24.2	22.2	31.7	44
1929–33	19.8	17.8	25.4 + ?	32 + ?
1934–36		10.6	15.2 + ?	32 + ?
1837				38.7
1938				37.5
1939				36.5
1940				31.2

most lethal period, i.e., the naturally difficult first four years of life and collectivization. (According to Table 4.3, in 1926 the natural death rate for children during the first four years of life was 78.9‰, and it falls more than tenfold for the following age group.) Thus the share of survival among them by 1939 should not be substantially different.

Our plan of calculation is as follows:

A. From the total number of children in the 5–14 age group (according to the 1939 census) those from annexed territories should be excluded, because all censuses show that out of the 20.1 million people who were annexed, the 5–14 age group makes up approximately one-fifth of the population (i.e., in our case 4 million). Since they were born during "normal" times in those countries (here the term *normal* is used not in the sense of "social class" but in everyday usage), it means that both groups contain an equal share of that age bracket according to the 1970 census (see Table 6.1). (The data of the 1959 census is in this case less reliable, since children in the 10–14 age group were born during the disastrous postwar years, whereas the 5–9 age group was born under more favorable circumstances.) Deducting 2 million from each of the two groups, we obtain the number of children in both groups before territorial annexations. The stages of that calculation are shown in columns 2 and 3 of Table E.

B. We assume that the proportion of children in these two groups equals the number of babies born. We further assume that the share of

losses due to privation and disease is equal in both groups. This hypothesis is applicable to deaths from natural causes, but for deaths caused by privation the hypothesis is approximate, because the younger group seemed more affected. As revealed in Table 4.2: in 1939 the 5–9 age group (second line) had less boys than girls, while in the 10–14 age group the number of boys was slightly higher. The censuses of 1959 and 1970 show a preponderance of boys until age 20, proving the unnaturalness of this situation.

C. Let us denote the number of children born in 1924–28 and still alive by 1939 as B, and those born between 1928–29 and 1933 and alive by 1939 as B_1. Consequently, the number of births in these years is designated by C and C_1. Then, the hypothesis of the proportion $C/C_1 = B/B_1$, yields $C = B/B_1 \cdot C_1 = 17.8/22.2 \cdot 31.7 = 25.4$ million. The above number of births is included in Table E. Let us examine how the results would have changed if we had assumed that absolute equal shares of these infants had died. We would then have $C - C_1 = B - B_1$; $C = C_1 + B - B_1 = 31.7 + 17.8 = 22.2 = 27.3$ million. The derived 27.3 million is 10% higher than 25.4 million. It reflects the stability of the technique of restoration according to the "base point." However, we shall retain the conservative figure in Table E.

D. A rough estimate of the number of births in 1934–36 proceeds as follows: by 1939 these children were 2–4 years old and according to Table 6.1 there were 23.7 million children in 1939 in the age group 0–4. We have to deduct the number of children from the annexed territories. The yearbook (Bibliography, no. 6) contains data on the birth rate for all union republics in 1940. It was very low in Estonia (16‰), higher in Lithuania (23‰), 27‰ in the Ukraine and in Byelorussia, and 31‰ across the entire country. Assuming that approximately 10% of the annexed population was in the 0–4 age group (2 million), as against 12% for the entire country, we arrive at 21.7 million. The 0–1 group (born in 1937 and 1938) may be separated from the above as follows: infant deaths prior to 12 months ($170/1000 \times 6.36 = 1.08$ million) are excluded from infants born in 1937 (see Table 1.2): $38.7/1000 \times 163.8 = 6.36$ million. From the number of children born in 1938 (6.27 million), we exclude half of the infants who died before 12 months (0.50 million) because they were registered as a part of the 0 age group. Thus we derive the number of births in 1934–36 and survivals by 1939: $21.7 - 6.36 + 1.08 - 6.27 + 0.5 = 10.6$ million. Restoring the number of births in these years (1934–36) by using the same proportion as in (B)

we obtain: $10.6/22.2 \times 31.7 = 15.2$ million and supplement Table E, column 4. The unknown total population for 1929–36 necessary for the calculation of the birth rate is estimated by interpolating the data in Table 3.1. Let us now analyze the results presented in Table E.

Our calculation of the birth rate in 1929–36 was deliberately conservative. Other reasonable techniques (for example the assumption that infants who had lived longer under conditions of privation had a higher death rate proportionate to the length of survival during the period of privation) yield a higher number of births. This is also confirmed by the fact that the birth rate in 1929–36 (see Table E) is not only lower by 27% than in 1926, and below its interpolated quantities for 1938 and 1937, but also smaller than the lowest figures published for 1937–39 (see Table E, last column). Only in 1940 was the birth rate lower than in 1929–36, as a result of the Soviet/Finnish War.

Now we shall examine what happened to the children who survived collectivization (see Table F). The mortality of these children is extremely high and comparable only to the mortality of war participants (born 1924–28). Among those who did not directly serve in the army (born 1929–33), mortality was considerably lower. The author of *The Gulag Archipelago* is right in asserting that more people died from internal repression than as a result of various wars.

Now we have all the necessary data to compute the number of deaths due to privation during the large-scale imposition of socialism. We shall estimate the minimal number of births in 1929–36 as 40.5 million. Table D contains data on the death rate from natural causes; the total population can be estimated by interpolating the data in Table 3.1. Applying the former to the latter we arrive at the number of deaths from natural causes for the entire eight-year period—20.6 million. A

TABLE F
Fate of Children Born in 1924–33

Year of birth	Born (in millions)	(1) Died before 12 months (in millions)	(2) Died by 1939 census (in millions), excluding (1)	(3) Died by 1959 census (in millions) excluding (1) and (2)
1924–28	31.7	5.7	3.8	5.2
1929–33	25.4 + ?	4.6 + ?	4.0 + ?	1.6

Source: Table E.

TABLE G
Average Annual Population Balance (1926–1940)

Years	Births	Natural deaths	Deaths from privation and repression	Rate of population increase
1926	6.3	2.9	≈0	3.4
1929–1936	5.1 + ?	2.6	1.2?	1.3
1937–1940	6.3	2.2	0.8	3.3

natural increase should have amounted to at least 40.5 − 20.6 = 19.9 million, but actually the population increased only by 10.4 million, which means that over 9.5 million people (1.2 million annually) died during the eight-year period (1929–36) from privation, either in camps or in rural areas.

Table G indicates the average annual population balance during the years of "great achievements" and the modest year of 1926. If we ever discover that in those years the average birth rate was at least at the 1937 level, the number of persons who perished would increase by 2 million annually and amount to 16 million for the eight-year period. This phenomenon was taking place at the same time that the demographer Maksimov was making his bold assertions about surpassing the rate of increase in the populations of the United States, England, Germany, and France during 1926–39.

7.
War Casualties and Losses Due to Privations during World War II

By 1940 the total population of the country reached 194.1 million, but the rate of population increase in 1940 (Table 1.2) was 13.2‰, which by the beginning of 1941 yields a population of 196.7 million, as indicated in published data. But according to Table 3.1, in the beginning of 1950 there were 178.5 million people. Thus the *negative* difference amounts to 18.2 million in nine years, including the five postwar years, but official sources claim that during the war only 20 million people died.

A rough estimate of losses may be calculated as follows: the population by 1946 is extrapolated retrospectively beginning with 1950 and assuming that the annual rate of increase equaled 3 million people (the lowest annual increase in the 1950s—see Table A). Consequently the 1946 population would be $178.5 - 4 \times 3 = 166.5$ million persons, which again yields a 30.2-million war deficit. This is also an estimate of war losses, if we assume that the birth rate during the war was at least equal to the natural mortality.

There may be another approach to this problem. The 1959 census returns concerning the 20 and over age group (see Table 6.1) give a figure of 130.1 million. They are the survivors of a 1939 population of 190.6 million. It follows that out of those who were alive in 1939, by 1959 60.5 million had died or perished. A comparison with a normal twenty-year period is in order: 31 million persons alive in 1950 had died at the time of the 1970 census (i.e. 30 million less). To carry out a more exact estimate of war casualties, that is soldiers and officers who were killed or died from injuries, people killed during the occupation, civilians who starved to death or died due to war hardships, as well as displaced persons and prisoners of war who returned to the USSR and were subjected to Stalinist reprisals, we need to define:

TABLE H
Summary of Published Data Necessary for the Calculation of Births in 1941-49 (in millions)

Years of birth	Alive by 1959 census	Years of birth	Alive by 1970 census
1939-43	16.5	1940-44	13.8
1944-48	15.3	1945-49	17.2
1949-53	22.0	1950-54	22.0

Year	Number of births	Number of children who survived first year of life
1939	6.95	5.8
1940	6.05	4.9
1950	4.76	4.4
1955	5.0	4.7

A. The difference in the population of 1941 and 1950. The relevant figures were previously given.
B. The number of births in 1941-49. We suggest restoring this figure on the basis of relevant age groups cited in the 1959 and 1970 censuses.
C. The number of people who died from natural causes in 1941-49 can be restored by using data from Table D.

Thus, an estimate of losses will be: A + B − C. Calculations are complicated by the omission of population figures for 1948 and 1949 (statisticians were unable to estimate the population in 1946 and 1947 because of the great number of demobilized and displaced persons). To calculate the number of births, we shall transcribe census information in Table 6.1 into Table H. The former reveals the number of persons and their year of birth according to the 1959 and 1970 censuses, as well as the number of children born who survived the initial 12 months of life.

Calculation pursuant to (B): we define the number of persons born in year N and alive by census year K as $B_K(N)$. For example, the number of persons born in 1939 and alive in 1970 is defined as $B_{70}(39)$; the number of persons born in 1944-48 and alive in 1959 as $B_{59}(44\text{-}48)$ (see Table H for $B_{59}(44\text{-}48) = 15.3$ million). First simplification: we assume that all persons born in 1939-54 and living in 1959 were alive in 1970, i.e., $B_{59}(\ldots) = B_{70}(\ldots)$. It is readily justified for our calculation by

the negligible mortality of young people in that age group which amounts to 1–2% (see Table 4.3) in 1959–70.

Second simplification: the number of persons born in 1950 or thereafter and alive in 1959 can be derived by deducting from the number of births the number of infants who died before the age of 12 months. Let us apply this method for the calculation of the number of people born in 1950–54 and then compare the derived results with the actual figures. According to Tables 4.3 and H, the number of births in 1950 is equal to 26.7/1000 × 178.5 = 4.76 million; 81/1000 × 4.76 = 0.39 million died before reaching 12 months the same year, and therefore 4.37 million children survived. An analogous calculation for the following year produces 4.37 + 4.43 + 4.49 + 4.56 + 4.63 = 22.8 as against the actual figure of 22 million people (see Table H). The deviation is negligible.

Since the five-year age groups (see Table H) were shifted by one year in the censuses of 1959 and 1970, the following data can be consistently restored: the number of persons born in 1949 equals in 1959

$$B_{59}(49) = B_{59}(49\text{–}53) - B_{70}(50\text{–}54) + B_{70}(54) = 22.0 - 22.0 + 4.6 = 4.6 \text{ million.}$$

A consistent calculation by an analogous method yields $B_{59}(44)$, $B_{59}(39)$, $B_{59}(41\text{–}43)$, $B_{59}(45\text{–}48)$. The number $B_{59}(40)$ is restored by the proportion of the known number of persons who survived the age of 12 months in 1939 and 1940 and the earlier calculated meaning of $B_{59}(39)$. All these figures are given in Table I.

We have detailed data on the number of persons born during the war or in postwar years and were living in 1959. The number of births is restored with a correction for the mortality of infants before their first year of life. It would result in a negligible decrease in the birth rate: for example, the percentage of children who survived their first birthday in 1940 but died during the war equals only 7% of the total number of children born in 1939 (see Tables H and I). The state began caring for children after the demographic gaps of 1929–36 (and prohibited abortions after 1936). The death rate of infants under 12 months during the war should be assumed to be equal to the high prewar level of 160–180‰, but in 1945–49 we can assume it was at the level of the early 1950s (80–120‰). Multiplying the number of survivals in 1959 by 1 plus the infant mortality rate, we derive the number of births and

TABLE I
Number of Births and Deaths from Natural Causes during World War II and Related Years

Years of birth	Survivals by 1959 (in millions)	Births (in millions)	Approx. births (‰, annual average)
1939	5.4	6.95	36.5
1940	4.6	6.05	31.2
1941-43	6.5	7.9 ± 0.4	14.5
1944	2.7	3.3 ± 0.2	20.0
1945-48	12.6	14.0 ± 1.0	20.6
1949	4.6	5.1 ± 0.1	29.0
1950	4.4	4.76	26.7

Total number of births from 1941 to 1949: 30.3 ± 1.1 million

Year	Natural deaths (‰)	Approx. population (in millions)	Natural deaths (in millions)
1941	12.4	190	2.4
1942	12.0	185	2.2
1943	11.7	180	2.1
1944	11.4	175	2.0
1945	11.0	170	1.9
1946	10.7	171	1.8
1948	10.0	174	1.8
1949	9.6	176	1.7

Total number of deaths from natural causes in 1941-49: 17.8 ± 0.4 million (an error of 5% is assumed as in Table D).

the error resulting from the variation of the infant mortality rate. Table I gives the results of the calculation.

We learn that in the 1941-44 war years approximately 11.2 million children were born at an average annual rate of 2.8 million. The birth rate was at the level of 14-20‰ as against 31.6 in 1940 and 26.7 in 1950. We cannot but admire those Soviet women who continued to give birth during the difficult war years and thus greatly prevented the decline of the Soviet population. The birth rate during the war was higher than mortality from natural causes. In the postwar years of 1946-49, 19.1 million were born, at an annual average of 3.8 million, at the level of 20-29‰. Families continued to live under conditions of great hardship.

Now we shall restore the number of deaths from natural causes in 1941–49 (see Tables D and H) by multiplying the mortality rate by the rough population estimate. Table I gives the results for individual years and a total for 1941–49 as 17.8 ± 0.4 million. The error is assumed to be 5%.

The number of people who perished is equal to the difference between the size of the population in 1941 and 1950—18.2 million, plus the number of people born in 1941–49 (30.3 million), less the number of deaths from natural causes (17.8 million), yielding a total of 30.7 ± 1.2 million. The error is estimated according to the formula of standard deviation on the basis of all errors. Thus the approximate number of war casualties is 30 million. We shall attempt to estimate the number of battle casualties. To that end, we shall separate the number of male losses who were of draft age during the war from the number of female losses. At the same time, this estimate provides another opportunity to verify the total number of people who perished by using a technique that omits the number of births during the war years.

To arrive at the number of males and females for all age groups during the census years (Table J), we shall use data from Table 6.1 and the available ratio of the male population to the female (Table 4.2). Figures in Table J are computed in the following manner: Assuming that *A* stands for the total population of any one of the age groups during any one year (see Table 6.1) and *P* represents the number of males per thousand females in the same age group and for the same year (see Table 4.2), the number of males *M* would be equal to:

$$M = A \times \frac{P}{1000} + P$$

For example, there were 15.79 million in the 20–24 age group in 1939 and the male/female ratio was 937/1000. The number of males equals 937/1937 × 15.79 = 7.63 million.

The draft age started at 17 during the war. Therefore, males and some females who were 13 and older in 1939 participated in military operations. To avoid interpolating within age groups, we shall trace the fate of those who were 15–39 years old in 1939. Under normal conditions, mortality in that age group is negligible. By simple addition and subtraction of the relevant numbers (see Table J) we derive the following:

Alive in 1939 (aged 15-39)	Males	38.92 million
	Females	41.12 million
Alive in 1959	Males	20.14 million
	Females	33.22 million
Killed and died 1939-59	Males	18.8 million
	Females	7.9 million
Alive in 1970	Males	18.35 million
	Females	32.81 million
Died 1959-70	Males	1.8 million
	Females	0.4 million

How many people in the draft-age group were killed? Their death rate from natural causes was negligible. Another argument in support of this observation is that in 1959 they were under 59 years of age, but the average life expectancy in 1958 was 68 years. The error in this assump-

TABLE J
Age Distribution of Males and Females According to 1939, 1959, and 1970 Censuses (in millions)

Total population	1939 190.68		1959 208.83		1970 241.72	
Age groups	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
0-4	11.98	11.74	12.4	11.9	10.43	10.07
5-9	9.86	9.90	11.2	10.8	12.47	12.00
10-14	12.11	12.09	7.81	7.52	12.73	12.25
15-19	8.46	8.72	8.25	8.21	11.22	10.77
20-24	7.63	8.15	10.05	10.29	8.62	8.47
25-29	9.05	9.47	8.92	9.27	6.81	6.95
30-34	7.75	7.85	8.61	10.39	10.40	10.74
35-39	6.03	6.93	4.52	7.06	8.14	8.45
40-44	4.46	5.14	4.00	6.41	8.75	10.24
45-49	3.54	4.24	4.71	7.56	4.74	7.51
50-54	3.01	3.63	4.01	6.4	3.42	5.65
55-59	2.34	3.56	2.90	5.75	4.27	7.74
60-69	3.49	5.05	4.10	7.64	5.92	11.67
70-79	1.36	2.20	2.02	4.15	2.51	5.52
80-89	0.26	0.50	0.46	1.11	0.71	1.89
over 90	0.05	0.1	0.1	0.17	0.1	0.22

tion is much less than the number of deaths in 1959–70 (1.8 million males, 0.4 million females). The assumed error is around 0.9 and 0.2 million. Thus the number of deaths in the draft-age group (or more precisely, among those who were 15–39 years old in 1939) is 18.8 ± 0.9 million males and 7.9 ± 0.2 million females—about 26 million people of draft age perished during the war.

However, we did not include in our calculations the entire draft-age group, which made up only half of the total population, although the most affected half. The number of losses in that group corroborates the preceding estimate of 30 million war casualties. The number of battle casualties is probably close to 20 million, judging by the 18.8 million male deaths in the draft-age population. Could it be that the number of soldiers killed in battle or those who died from wounds is given as the official number of human losses during World War II? It is impossible to calculate the number of casualties for each war year. Although thirty years have elapsed since the end of World War II, the number of dead and wounded for each war year is still unavailable and cannot be deduced from any of the numerous memoirs written by field marshals.

Another question arises: how were war casualties calculated to yield the official figure of 20 million? By early 1941 there were 196.7 million people in the Soviet Union. By early 1950 the population was 178.5 million (18.2 million less), which included over 26 million children who were born in 1941–49. If we assume that 20 million perished during the war, it means that in addition to this figure, in 1941–49 *more than 24 million adults had died.* And what about the disappearance of 26 million draft-age people whose life expectancy would be high under normal conditions?

While General Petro Grigorenko was committed to special psychiatric institutions for defending human rights and the rights of the Crimean Tatars, and was later expelled from the country, a large volume was published (see Bibliography, No. 3), which asserted once again that the entire prewar policy of the USSR was correct and optimal. Not a word of criticism is suggested in regard to Stalin, Molotov, Voroshilov, and their colleagues, who used the state apparatus to repress the people and the army. It turns out that they brilliantly undermined the plans formulated by the "imperialist" ruling circles in England, France, and the United States, and the "reactionary" ruling circles in Poland, Rumania, Finland, Latvia, and Estonia. In the context of this book, they were comparable to Hitler.

In reading the nine essays included in the cited work, only one mentions any casualty figures. Only A.V. Antosyak, in describing battles which took place during 1944–45 outside USSR borders, gives numerical data: "During the course of more than one year an excess of 7 million Soviet military men led a stubborn struggle against Hitler's forces beyond the borders of our homeland. . . . More than 1 million Soviet soldiers and officers died courageous deaths, and the total losses came to 3 million men." Of course, the methodology used to derive this data was not explained. Perhaps foreigners counted graves? I am not a military person, and can only hope that someone competent in this area will comment as to how 3 million persons died out of an army of 7 million.

8.
Assumptions and Techniques

I have used only official publications, but in view of the fact that I am a physicist and not an expert demographer or historian, it is possible that I have been unaware of some of the available literature. Consequently, some subtle points may have been overlooked. I have attempted to analyze only data that can be understood without specialized training. However, contrary to official Soviet statistics, I have not concealed the methods and techniques used to derive my findings.

It is noteworthy that I did not analyze the loss of 22 million people who died between 1929 and 1939. I did not avail myself of the information on the population distribution in 1926 according to age groups. In numerous instances I did not provide more accurate estimates, and I have used conservative numbers in estimating the losses.

For the difficult period after 1926, the lower threshold of losses is used and the weakest link in the calculations is the estimate of the birth rate. It was assumed that the death rate of children born in 1929–36 was on the same level as that of those born in 1924–28. But if the birth rate during that period equals the mean arithmetic level of 1926–37, the estimate of births would increase to 53 million and the number of those who perished to 23 million. That would represent the upper threshold of the estimate.

Finally, this study disregards migration processes because population figures for the USSR within the 1939 boundaries are in fact cited by TsSU reference books as population figures for the post-1945 boundaries. In other words, the migrations of 1939–45—when boundaries were changed—are already taken into account in official statistics, with the exception of the political emigration that took place during World War II, which, in the context of forced repatriations, was insignificant.

9.
Potential USSR Population Changes in 1926–50 without Repressive Policies and World War II

Accepting the hypothetical situation in the title, the population would have been increasing at a steady rate and it would have been sufficient to have population figures every five years, and the population during the interim years could easily have been interpolated. Such a table may have been computed under the following assumption: the decrease in birth and death rates between the actual 1926 and 1950 level was linear. The hypothetical results of such a calculation would be as follows:

Year	Birth rate (in thousands)	Death rate (in thousands)	Hypothetical population (in millions)	Actual population (in millions)
1925	44	20	140	140
1930	41	18	157	154
1935	38	16	174	160
1940	35	14	194 + 20*	174 + 20*
1945	31	12	235	165
1950	27	10	256	178

*"Joined voluntarily."

The population deficit would be: in 1930—3 million; 1935—14 million; 1940—20 million; 1945—70 million; 1950—78 million. A population of 250 million would have been attained 25 years earlier, around 1949 instead of 1974. This is in agreement with our assertion regarding the population deficit of 20 million in 1937.

We shall attempt a realistic estimate of the number of losses (figures taken from chapters 3–7, rounded off). As a result of the "liquidation of classes," losses during 1928–36 greatly exceed 10 million people, including men, women, and children. It is difficult to assess the upper limits of these losses, but a realistic estimate based on the 1937 birth rate (disregarding the very low 1924–39 figures) yields 16 million people.

The number of males who perished during 1927–38 exceeds the number of females by 4.1 ± 0.4 million and, without the years 1937 and 1938, 2.7 ± 0.5 million. In 1937 and 1938, 1.4 million ± 0.2 million died as a result of persecution. In 1939 and 1940, 1.8 ± 0.2 million died from persecution and the Soviet/Finnish War. During World War II, 31 million people ± 1 million died from war action or privations, including 19 ± 1 million males of draft age (born 1900–24) and 8 ± 0.2 million females of the same age. From 1950 to 1954, 450,000 males (accuracy up to 150,000) died as a result of forced labor camps. During this period *either* the number of prisoners was under 3 million and their death rate exceeded that of free people by more than ten times, *or* the number of prisoners exceeded 6 million and their death rate was less than 5 times as high as that of persons living outside camps and prisons. I wish to emphasize that all calculations are conservative and are based on official demographic data which was subject to censorship.

10.
Conclusion*

We have learned about the actions of those who have left their conspicuous imprints on demographic tables and about those individuals who vanished from these tables. This information was gleaned not from history books but from *The Gulag Archipelago.* I shall not discuss the moral and ethical aspects of these questions. The economic impact of the destruction and impoverishment of the peasantry and war losses is still felt in our everyday life and is partially reflected in the yearbooks issued by the Central Statistical Bureau (TsSU). For example, data on gross agricultural production per capita is shown in the following table:

	Per Capita Production			
	grain	meat	milk	potatoes
		(in kilograms)		
1913	590	31	190	180
annual average				
1924–28	480	29	200	280
1929–35		no data available		
1936–40	450	23	155	290
1941–45		no data available		
1946–50	380	21	190	375

The 1913 per capita production of meat and grain was attained in the USSR forty years later—approximately by 1956. The Soviet Union's per capita production of grain (730 kg) and meat (55 kg) is still below the 760-kg grain and 154-kg meat production in Australia.[1]

Returning to demography, we shall conclude on an optimistic note. After the Twentieth Party Congress, demographic tables have ceased to reflect the severe population upheavals of previous years, and substan-

tial agreement between overall and natural mortality has been observed, as well as its low level. There has been a gradual decrease in the birth rate. Large-scale repression has ceased and the standard of living has risen to a level considerably higher than what the population had been accustomed to. The people have adapted to the conditions imposed by the regime. In this respect, "Soviet man" has indeed emerged. The small number of dissidents who have refused to respond to Soviet life with silence and applause leave no traces in the demographic tables. Yet even here positive changes have taken place, for now we know their number and even their names without the help of demography.

Notes

**1978 note:* I have not revised the manuscript since 1976. At the suggestion of experts I have made certain deletions and corrections, and have provided further explanations of the calculations.

1. See *Strany mira, Izdatelstvo politicheskoy literatury* (Moscow, 1974).

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Unnatural Deaths in the USSR, 1928-1954

Iosif G. Dyadkin
Introduction by Nick Eberstadt

This astonishing and sobering account of government- and war-induced civilian deaths in the Soviet Union calculates that Soviet loss of life between 1928 and 1954 was far higher than Western experts have ever believed. Applying mathematical techniques to Soviet demographic statistics, Dyadkin shows that Stalinist repression and World War II must have taken the lives of between 43 and 52 million Soviet citizens.

In the first period, 1929-36, one of collectivization, Stalin controlled and eliminated classes; during the Great Purge of 1937-38, millions of Communist party members and bureaucrats were executed, and then the purge extended into the Red Army. Dyadkin shows that World War II took close to 30 million lives and that during 1950-53 another 450,000 died in prison camps.

Although not a trained demographer, Mr. Dyadkin cites his considerable experience with applied mathematics.... The only comprehensive study of the subject published in either the East or the West.—The Wall Street Journal

Iosif G. Dyadkin was professor of geophysics at the All-Union Geophysical Research Institute, Kalinin, USSR, until his arrest in 1980 for writing this work and sending it to exiled author Alexander Solzhenitsyn. He is the author of more than fifty articles on geophysics.

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